Telecommunication Services in Disasters

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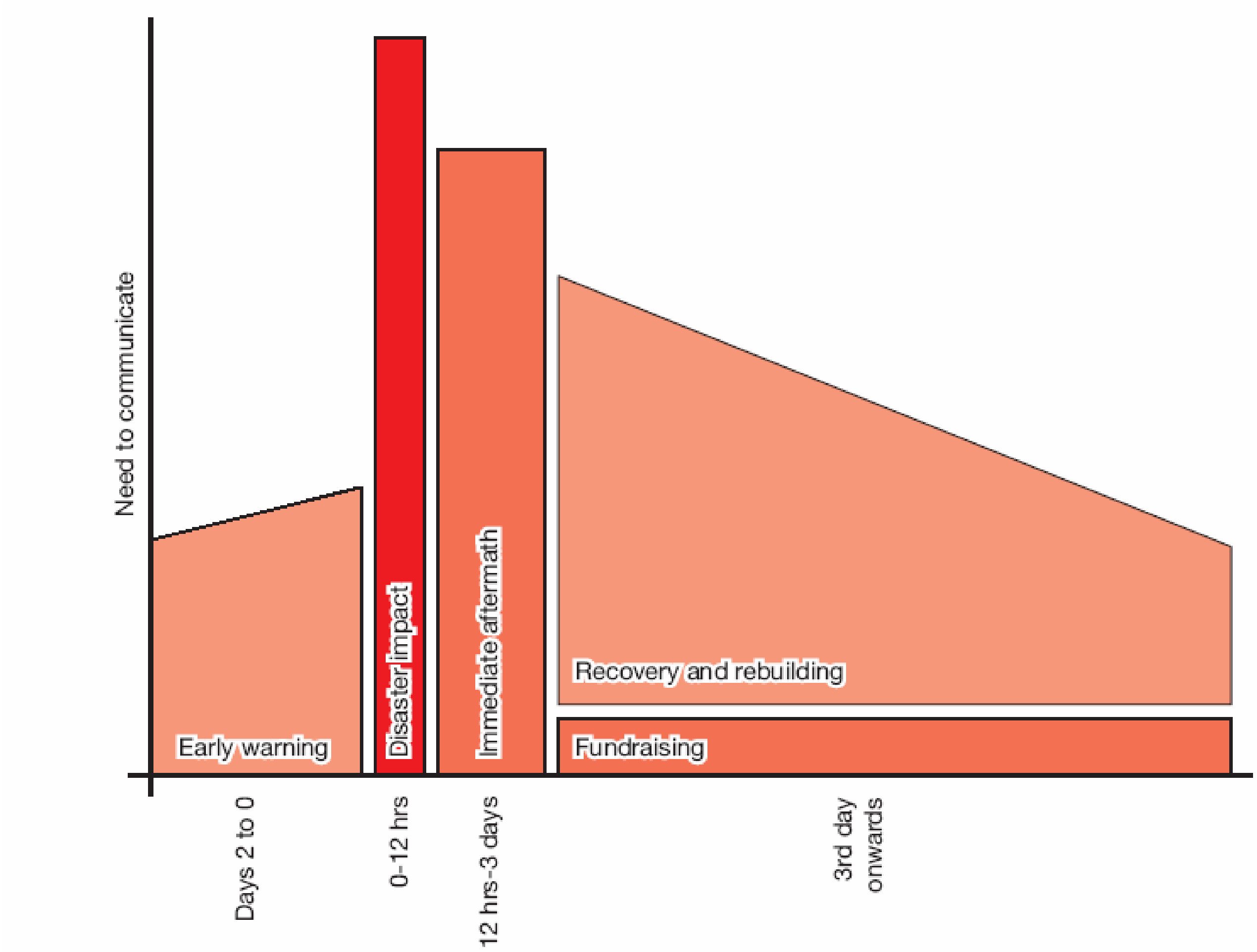
Topics of Discussion

- The Public Telecommunications Network
- Cellular Network Response & Recovery to Disasters
- Satellite Phones
- Government Emergency Telecommunications Service (GETS)
- Wireless Priority Service (WPS)
- Telecommunication Service Priority (TSP)
- Early Warning - Commercial Mobile Alert Service (CMAS)
- What You Should Do To Prepare Your Telecommunications For Disasters

[redacted]

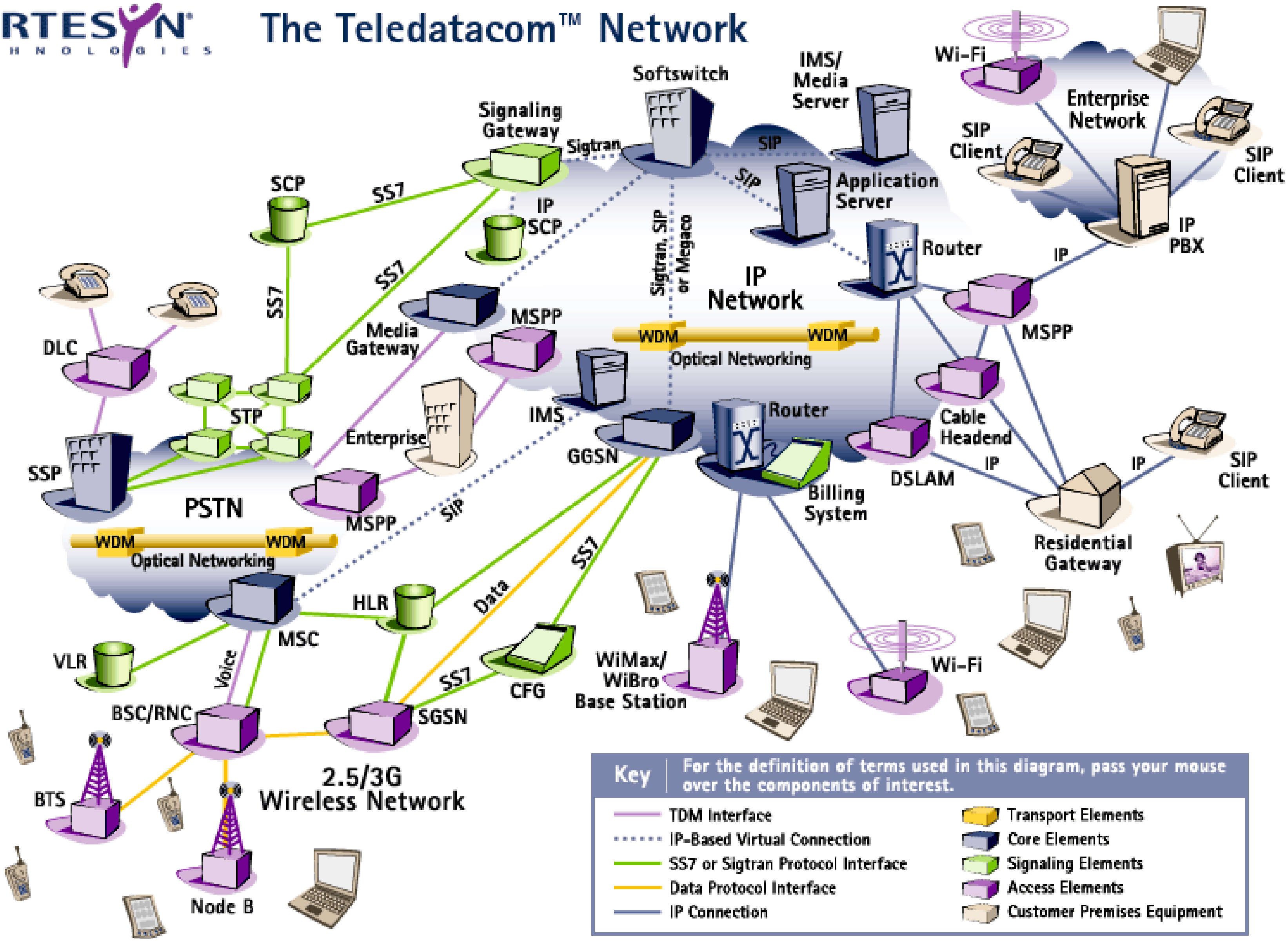
'Jericho' on CBS depicts how Americans deal with aftermath of nuclear detonation

Communications Needs at Different Phases of a Disaster



Source: GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, December 2005

The Teledatacom™ Network



Key For the definition of terms used in this diagram, pass your mouse over the components of interest.

- TDM Interface
- IP-Based Virtual Connection
- SS7 or Sigtran Protocol Interface
- Data Protocol Interface
- IP Connection
- Transport Elements
- Core Elements
- Signaling Elements
- Access Elements
- Customer Premises Equipment

The Plain Old Telephone System (PSTN)

- The PSTN contains thousands of switches
  - Switches include redundant hardware and extensive self-checking and recovery software
  - For several decades, AT&T has expected its switches to experience not more than two hours of failure in 40 years
- Major sources of failure identified from FCC outage reports are[1]:
  - Human error (on the part of both telephone company personnel and others)
  - Acts of nature
  - Overloads
    - Overloads caused nearly half of all downtime (44 percent) in terms of outage minutes

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[1] Sources of Failure in the Public Switched Telephone Network, D. Richard Kuhn, IEEE Computer, 1997

Figure 2: Magnitude of Failure

(customer minutes- percent of total)

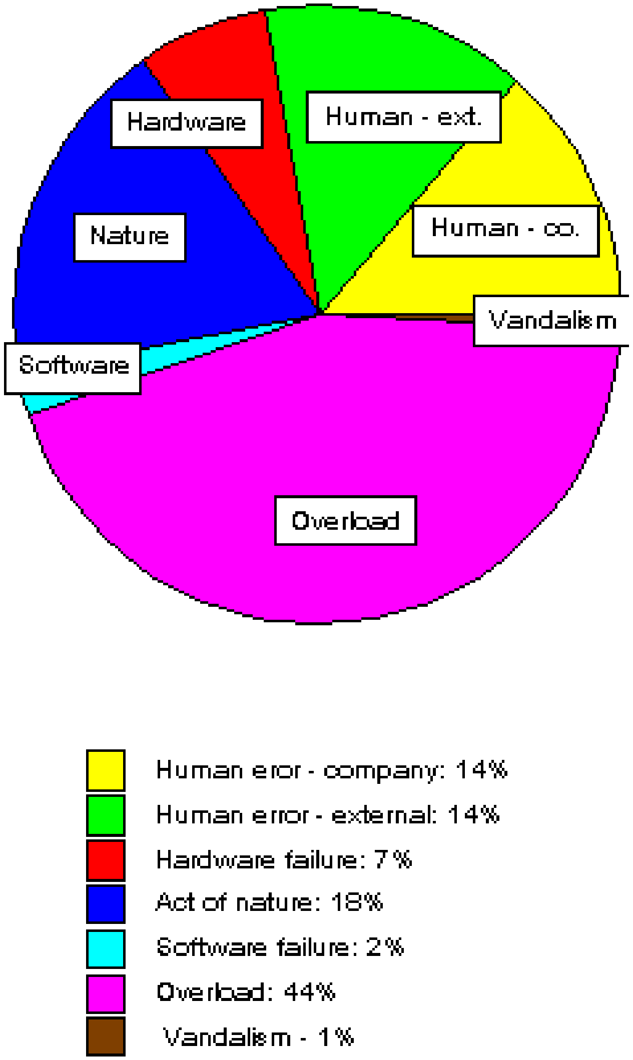
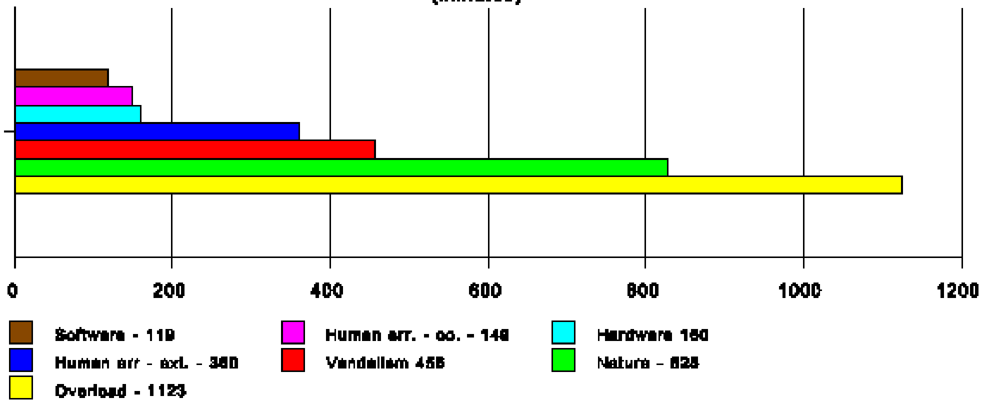


Figure 3: Duration of Outage

(minutes)



What Components in the Network Are Prone to Damage?

- Cable and outside plant equipment
  - Telephone poles
  - Junction boxes
  - Remote Units
- Transmission Equipment
  - Microwave “line of sight”
  - Fiber optics
  - Satellite
- Switching Centers
  - Power
  - Flooding

PSTN (aka Landline)

- The telephone network is designed based on the amount of traffic it expects to carry during the busiest hour of the day
  - Approximately 10% of everyone within that area dialing a making or receiving a call during that hour
- Dial tone is delivered on a "first come, first served" basis

Now, when a regional disaster hits, what percent of people do you think pick up their phones?

Other Factors for Landline Phones

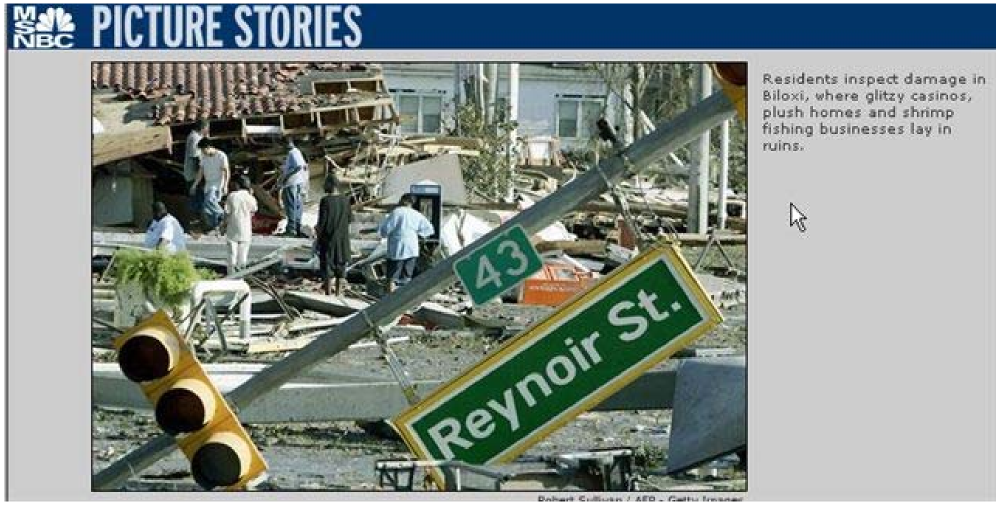
- In the case of an earthquake, the earth movement may also knock the receiver off, which makes the telephone switching equipment think that someone is asking for dial tone
- Burglar and fire alarm systems use their dialing abilities to report alarms caused by the tremor

But the PSTN is Reliable…

- Despite its enormous size and complexity, the PSTN averaged an availability rate better than 99.999 percent
  - Reliable software
  - Dynamic rerouting
  - Human intervention
    - Operators monitor telephone switches 24 hours a day and usually have the ability to modify switch software on the fly
    - Switch manufacturers provide 24-hour Support services, usually with a remote maintenance capability that allows them to correct software in a switch thousands of miles away
    - Human intervention corrected many failures in under one hour
      - Simply restarting a switch temporarily fixed a significant number of software-caused out-ages

What About Wired Pay Phones?

- Pay phones typically will remain operational or become operational before private phones



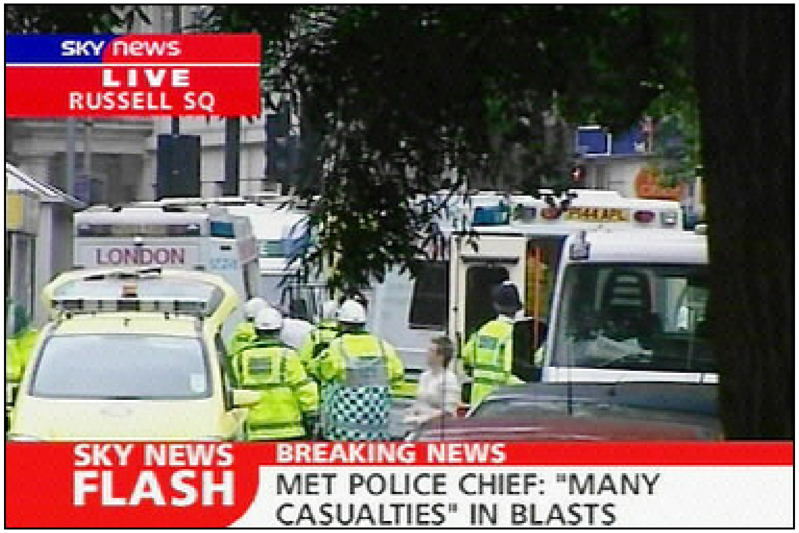
Residents inspect damage in Biloxi, where glitzy casinos, plush homes and shrimp fishing businesses lay in ruins.

Robert Sullivan / AFP - Getty Images

On 9/11, the telecommunications infrastructure in downtown Manhattan went down, causing long-term outages to 300,000 telephone lines and 3.6 million high-capacity data circuits

9-11-2001

July 7, 2005
London Bombings

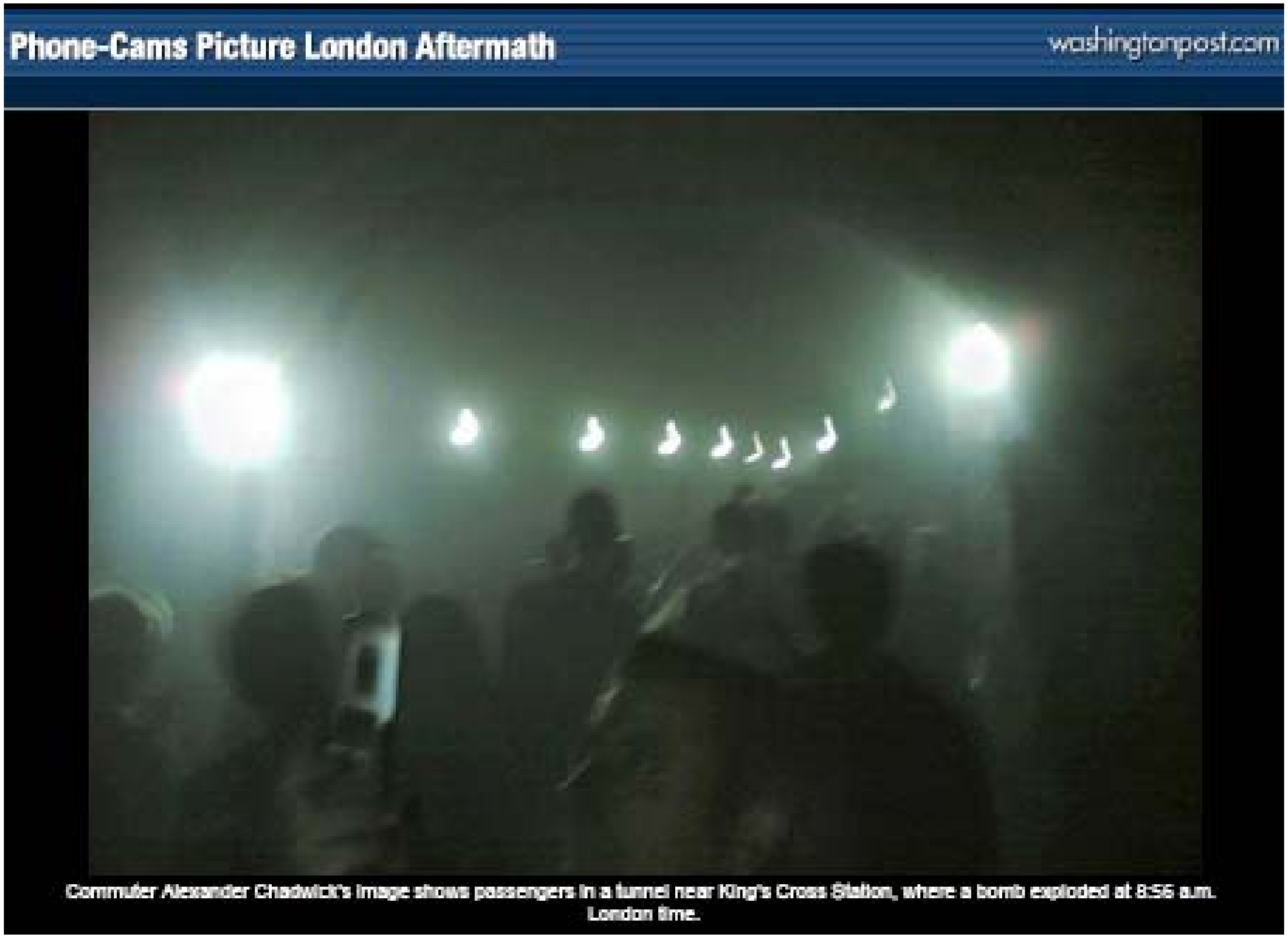


Camera Phones...

- London Bombs - was the first event involving large numbers of people carrying camera phones
- People caught up in the blasts emailed pictures to TV stations
- Mobile video footage provided by eye-witnesses was aired on TV within half an hour of the explosions

- The BBC received more than 300 emails containing
  - 900 still images on the day of the attacks
  - 50 within an hour
  - 22,000 text messages describing what was happening
- Raises issues about authenticity and privacy
- The Metropolitan Police in London requested that members of the public send in all the images they had taken in the aftermath of the London attacks, as part of their evidence-gathering process

Example Mobile Phone Picture From London Subway Bombing

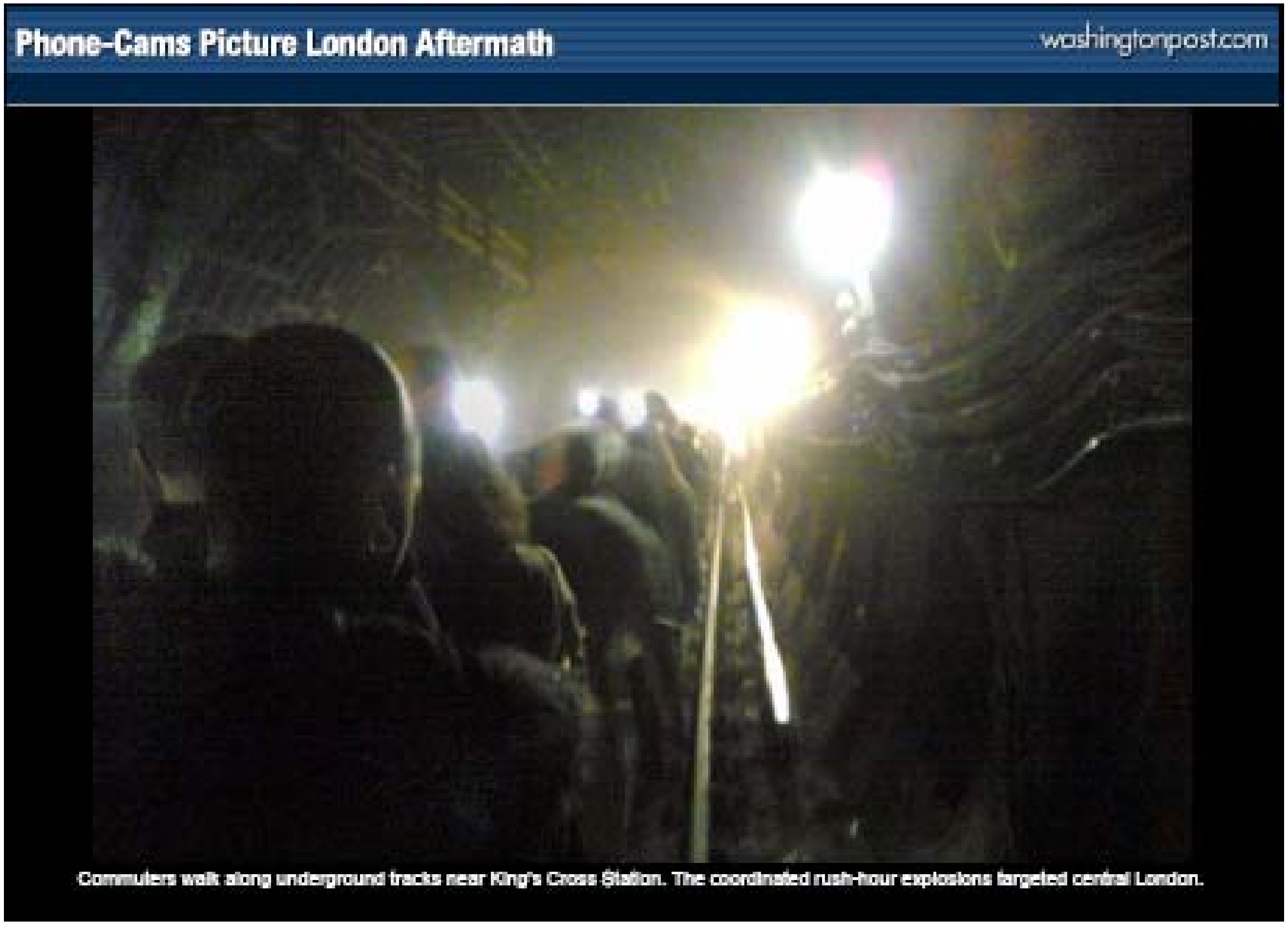


Phone-Cams Picture London Aftermath

washingtonpost.com

Commuter Alexander Chadwick's image shows passengers in a tunnel near King's Cross Station, where a bomb exploded at 8:56 a.m. London time.

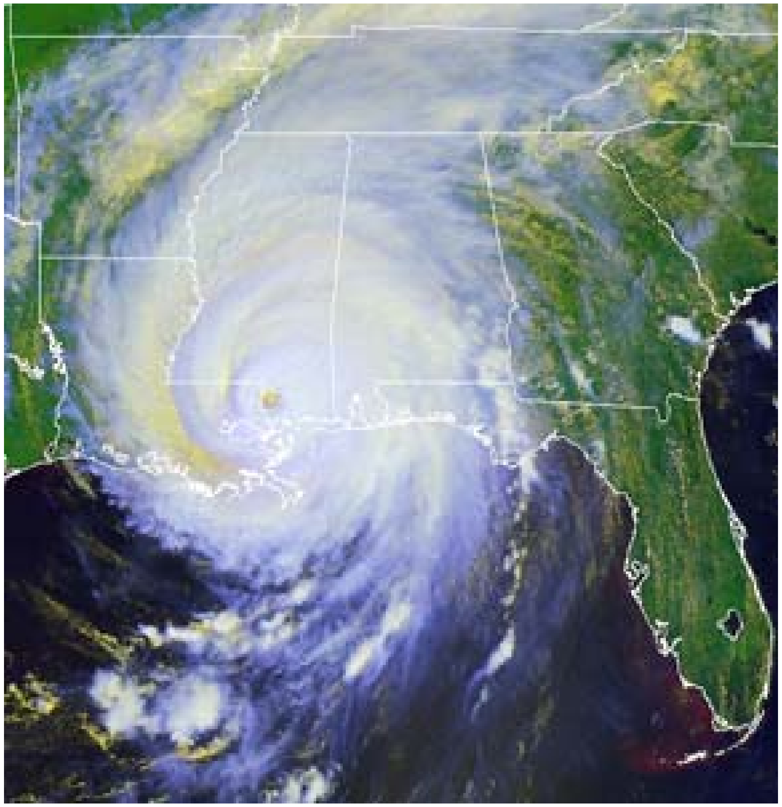
Example Mobile Phone Picture From London Subway Bombing



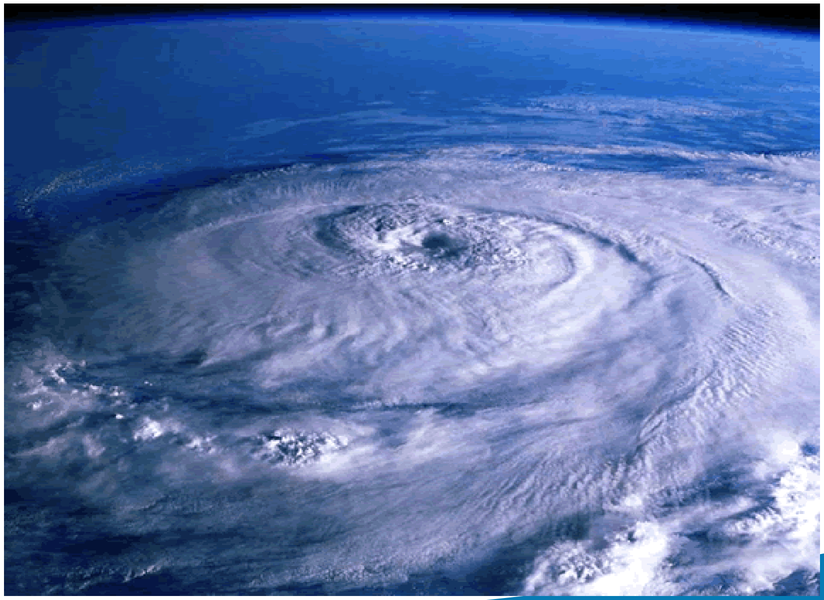
Phone-Cams Picture London Aftermath

washingtonpost.com

Commuters walk along underground tracks near King's Cross Station. The coordinated rush-hour explosions targeted central London.



Katrina 2005

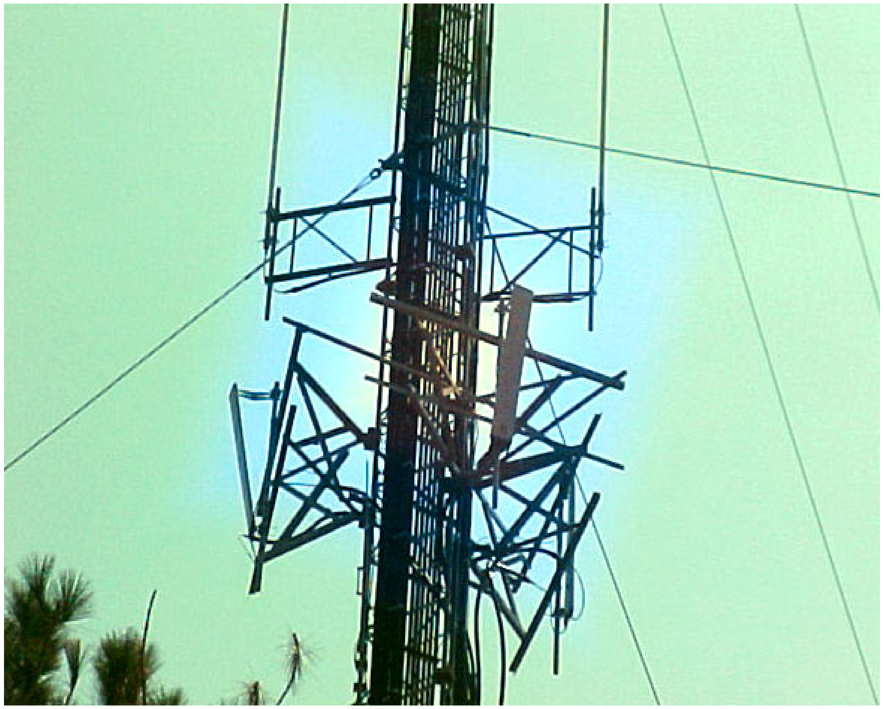


Katrina Impacts to Telecomm..

- Knocked out more than 3 million customer phone lines in the Louisiana, Mississippi, and Alabama area
- Wireline telecommunications network sustained enormous damage both to the switching centers that route calls and to the lines used to connect buildings and customers to the network
- Local wireless networks also sustained considerable damage –
  - more than a thousand cell sites were knocked out of service
- During this disaster, millions of telephone calls simply were not able to get through
  - Over 20 million telephone calls did not go through the day after the hurricane hit.
- Thirty-eight 9-1-1 call centers went down
- Of the 41 broadcast radio stations located in New Orleans and the surrounding area, only two AM and two FM stations remained on the air in the wake of the hurricane
- Hundreds of thousands of people were unable to receive news and emergency information, contact emergency responders, or communicate with their loved ones

Cellular Impact from Katrina

Though wireless operators build towers to withstand winds of 200 miles per hour, that does not make them invincible to the “debris-missiles” launched by 150 mile per hour wind



"E-mail, voice mail, web pages, stock quotes, news, banking...that's a lot of responsibility for such a little guy!"

Power is the Key…

“Many of Sprint's cell towers in the New Orleans area switched to batteries or generators but could not be recharged because crews could not reach them, Fleckenstein said. Some towers stopped working completely by early afternoon, and many more were expected to fail as power loss continues, he said.”

“Cellular provider Cingular Wireless also reported service interruptions in the coastal communities of Mobile and Baldwin, Ala., because of power outages. Cingular also had problems in New Orleans, Baton Rouge, and Biloxi, Miss.”

“Cingular said it had distributed more than 500 emergency generators, placed 240,000 gallons of fuel in them or on standby and had 25 teams ready to deploy to replace and refuel the generators once conditions are safe.”

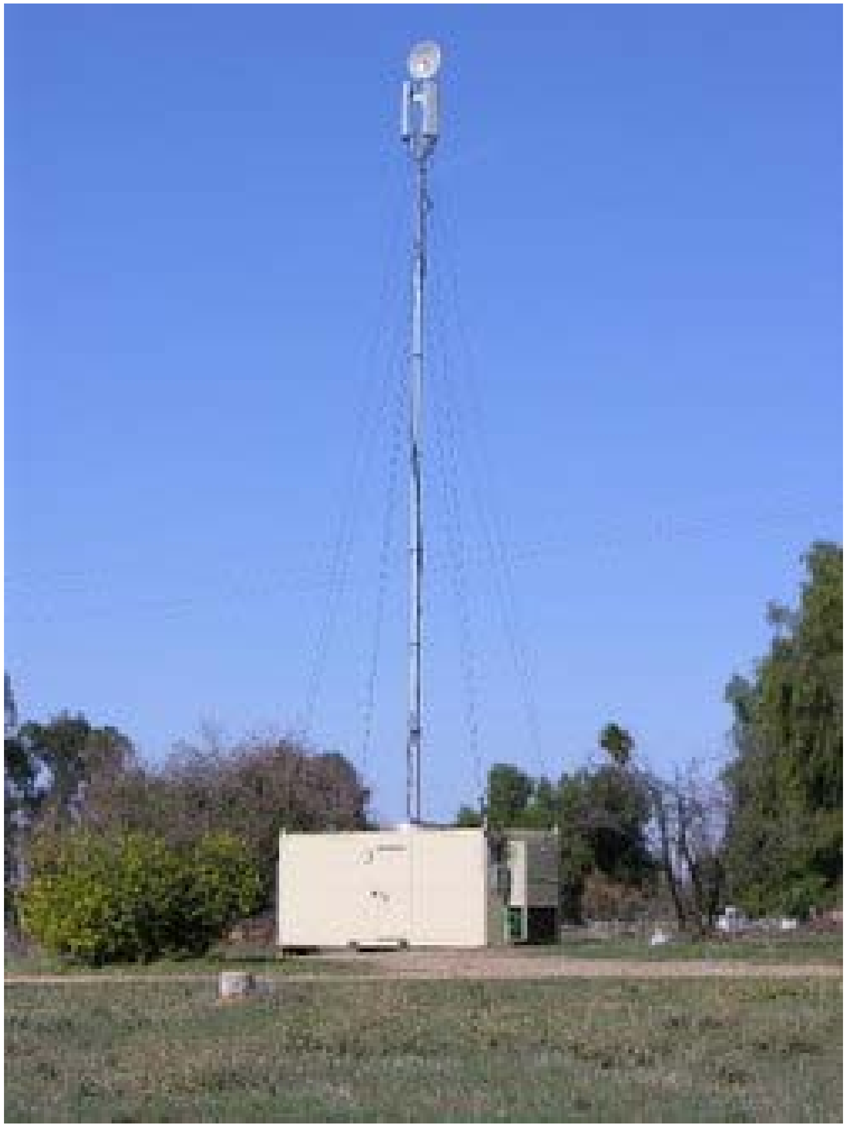
Source: USA Today, http://www.usatoday.com/tech/news/2005-08-29-telecom-issues-katrina_x.htm

Coverage Does Not Mean Capacity

- Within three weeks of Katrina’s landfall in Louisiana, Cingular had restored geographic coverage in New Orleans to 92 percent and in Biloxi to 97 percent

- But geographic coverage is not the same as capacity..
  - Overall capacity of the network was a bit further behind
  - September 19: combination of physical damage to 68 cell sites and the disruption of the wired networks in New Orleans and Biloxi => the network was functioning at 75 percent of capacity in New Orleans and 100 percent of capacity in Biloxi
  - But in Biloxi, where wireless is the sole means of communication for many people, call volumes were at 140 percent of capacity; and people were still experiencing some blocking as Cingular added additional capacity

CIAB
Cell-in-a-box



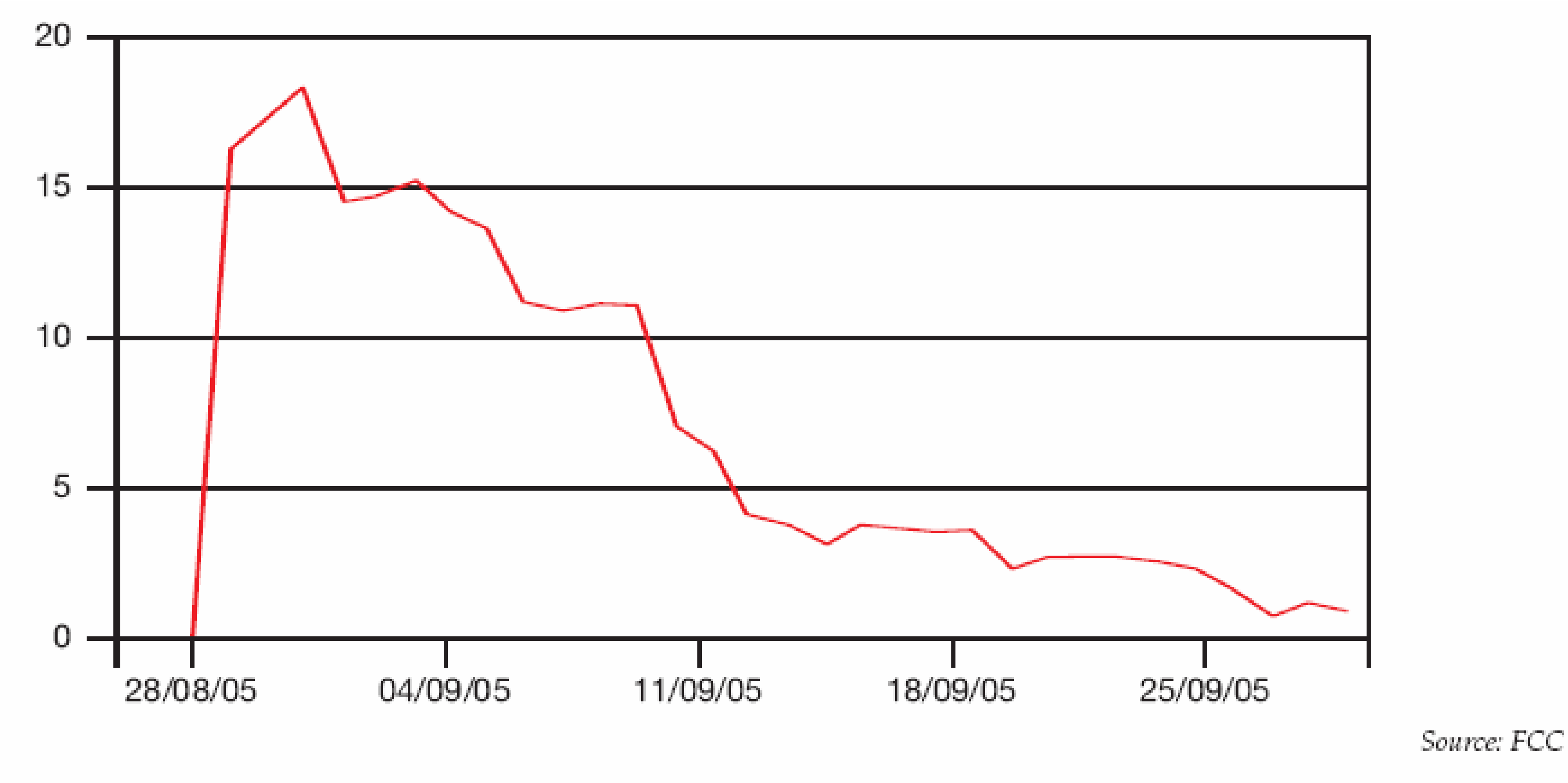
COWs
Cell on Wheels

30,000 BTU's of HVAC
On Board 12.5kW generator
and UPS power supply
Supports locking collar masts to 60'

COLTs
Cell on Light Truck

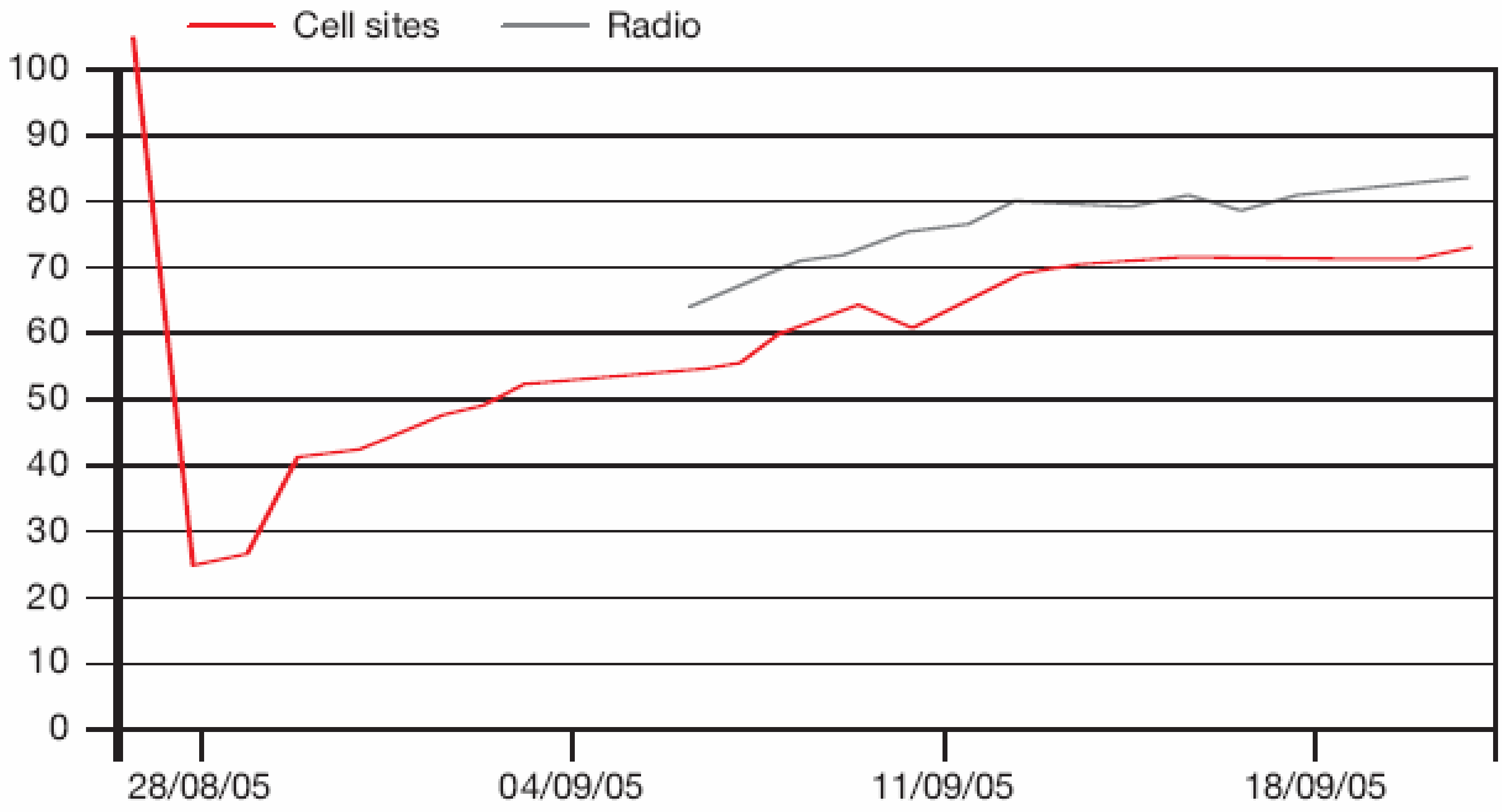
E-N-G's Cell-Sites-on-Wheels are expertly integrated with everything you need for rapid deployment and reliable field service.

Post Katrina Failed Calls, millions



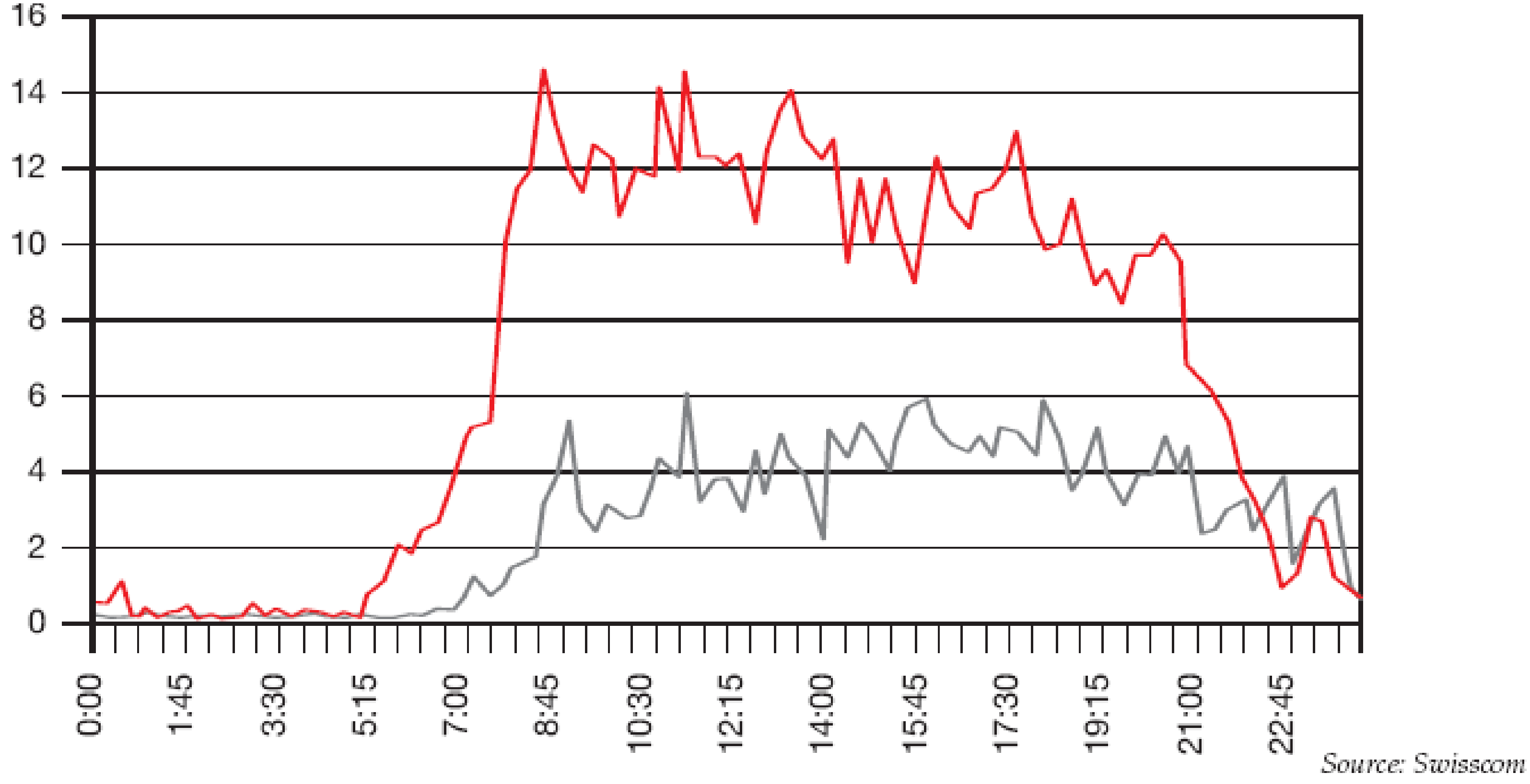
Source: FCC

Cell Site & Radio Restoration



Source: FCC

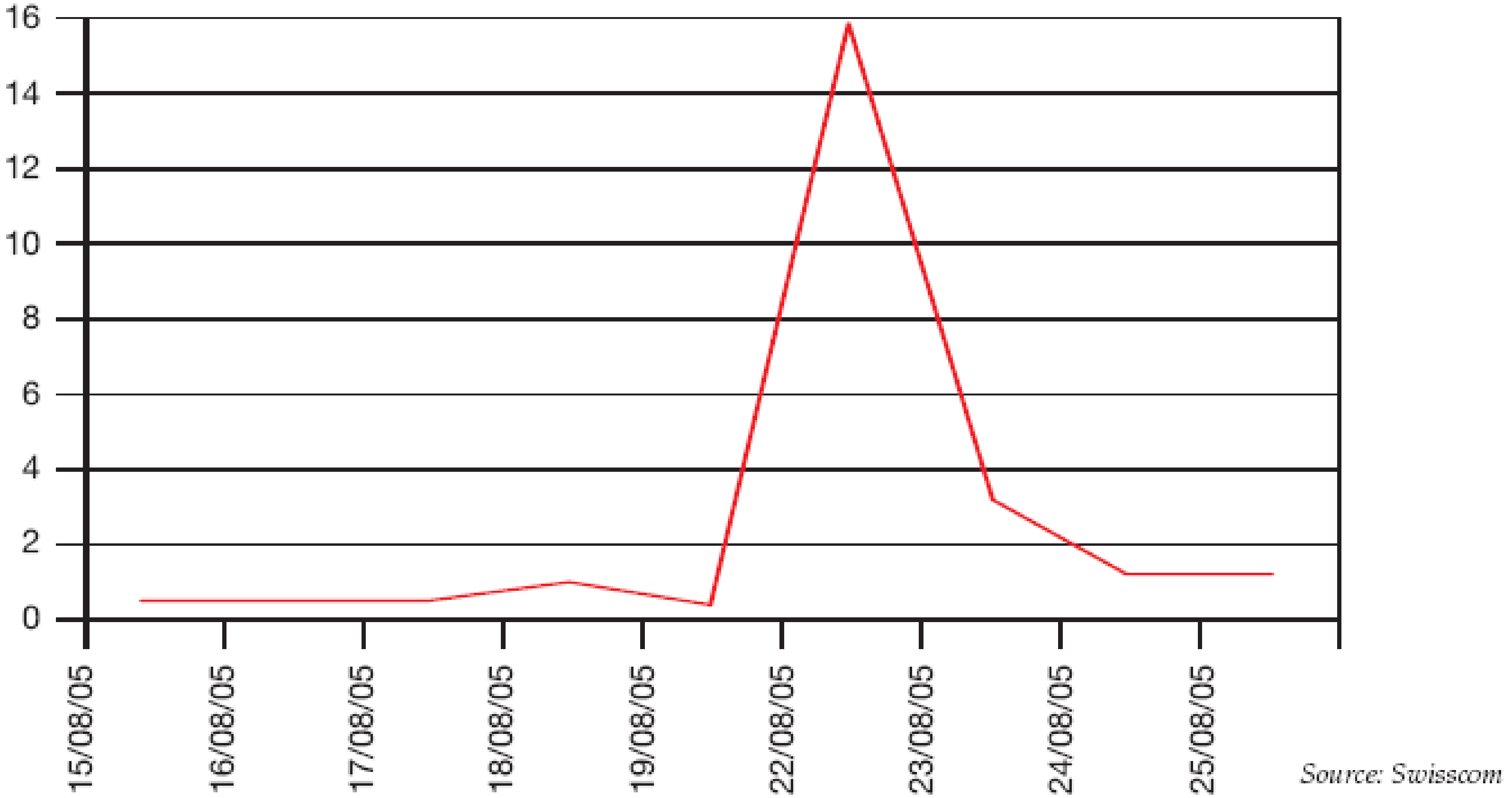
Example Call volume in Single Cell During Disaster Compared With Week Earlier



Source: Swisscom

Source: GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, December 2005

Example Congestion Time (in seconds)



Source: Swisscom

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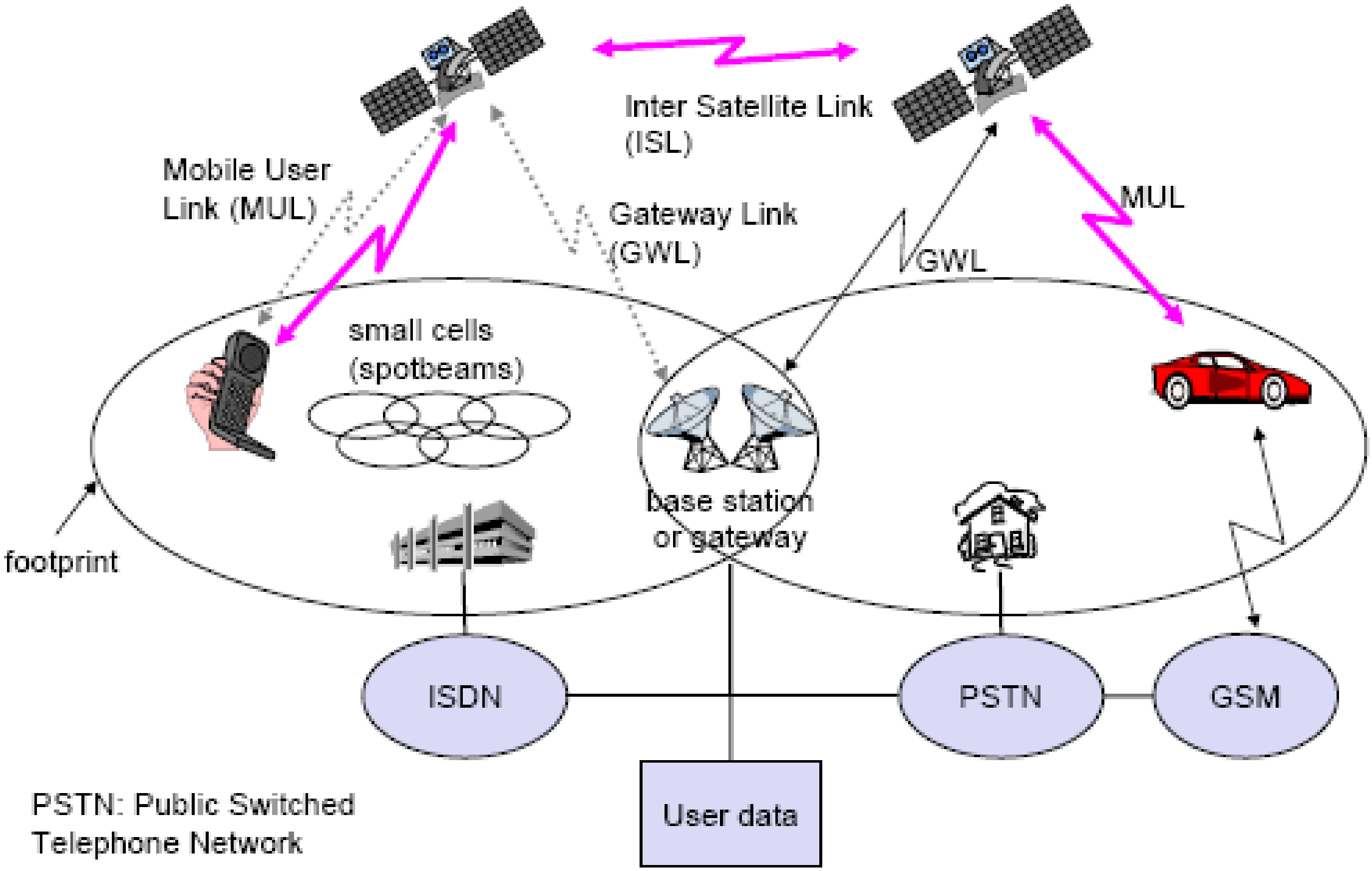
Satellite

Satellite service providers helped bridge some of the gaps left by the outages

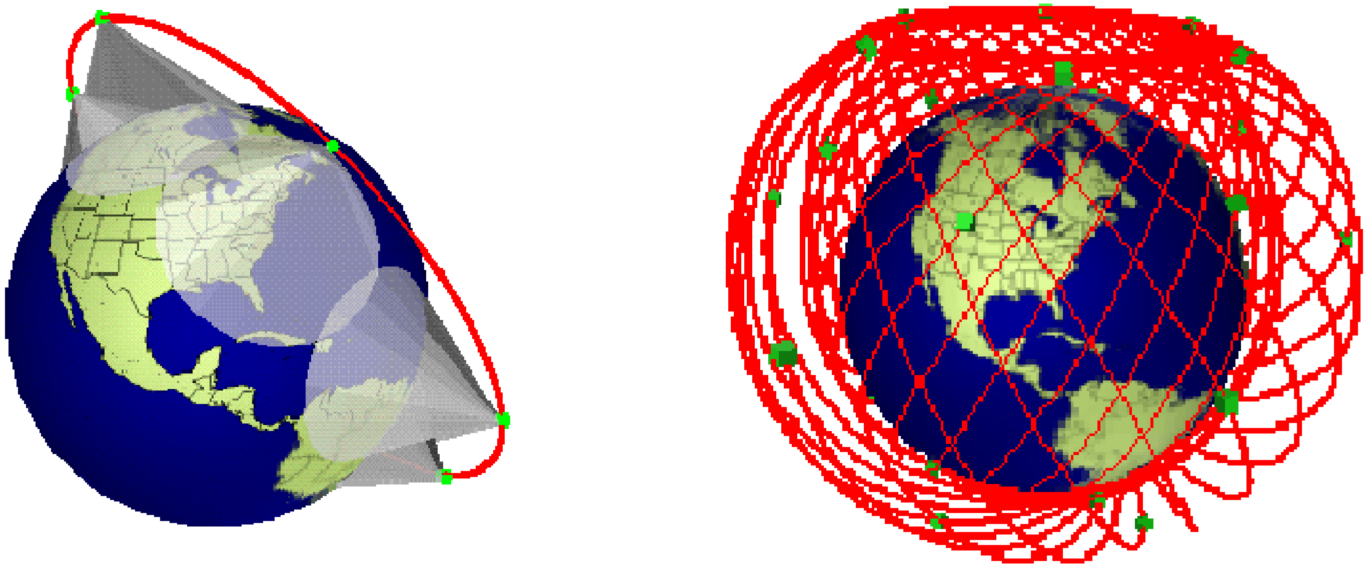
- providing satellite phones and video links to law enforcement officials, medical personnel, emergency relief personnel, and news outlets
- Number of available channels may be an issue
  - Congestion!

Satellite Phone System



PSTN: Public Switched
Telephone Network

Opposed to the terrestrial cellular system, the cell sites in the satellite systems are overhead and are moving !



Source: http://www.geom.uiuc.edu/~worfolk/SaVi/

Satellite Lessons Learned From Katrina

- Satellite is part of the solution
- When the terrestrial telephone and broadcast networks went down, satellites worked
  - XM Satellite Radio and DirecTV provided FEMA and the Red Cross with a 24/7 dedicated broadcast station for disseminating hurricane-related information to first responders and the general population
- Equipment should be in place before the disaster
- The day after Katrina hit, satellite installation and repair crews were ready to begin restoring communications
  - Unfortunately, too many of these professionals couldn't get permission from officials to enter the area

Source: Satellite Industries Association

Government Emergency Telecommunications Service (GETS)

GETS minimizes the possibility of the loss of wireline telecommunications services for NS/EP personnel during events such as

…hurricanes

…earthquakes

…and other disasters

“When the going gets tough, GETS keeps you going.”

[redacted]

What is GETS?

- The Government Emergency Telecommunications Service (GETS) is a White House-directed emergency phone service provided by the National Communications System (NCS) in the Information Analysis and Infrastructure Protection Division of the Department of Homeland Security.
- GETS supports federal, state, local, and tribal government, industry, and non-governmental organization (NGO) personnel in performing their National Security and Emergency Preparedness (NS/EP) missions.
- GETS provides emergency access and priority processing in the local and long distance segments of the Public Switched Telephone Network (PSTN).
  - It is intended to be used in an emergency or crisis situation when the PSTN is congested and the probability of completing a call over normal or other alternate telecommunication means has significantly decreased.

GETS Concept

- GETS uses these major types of networks:
  - The local networks provided by Local Exchange Carriers (LECs) and wireless providers, such as cellular carriers and personal communications services (PCS)
  - The major long-distance networks provided by Interexchange Carriers (IXCs) -
    AT&T, MCI, and Sprint - including their international services
  - Government-leased networks, such as the Federal Technology Service (FTS) , the Diplomatic Telecommunication Service (DTS), and the Defense Switched Network (DSN)

- GETS is accessed through a universal access number using common telephone equipment such as a standard desk set, STU-III, facsimile, modem, or wireless phone.
  - A prompt will direct the entry of your PIN and the destination telephone number.
  - Once you are authenticated as a valid user, your call is identified as an NS/EP call and receives special treatment.

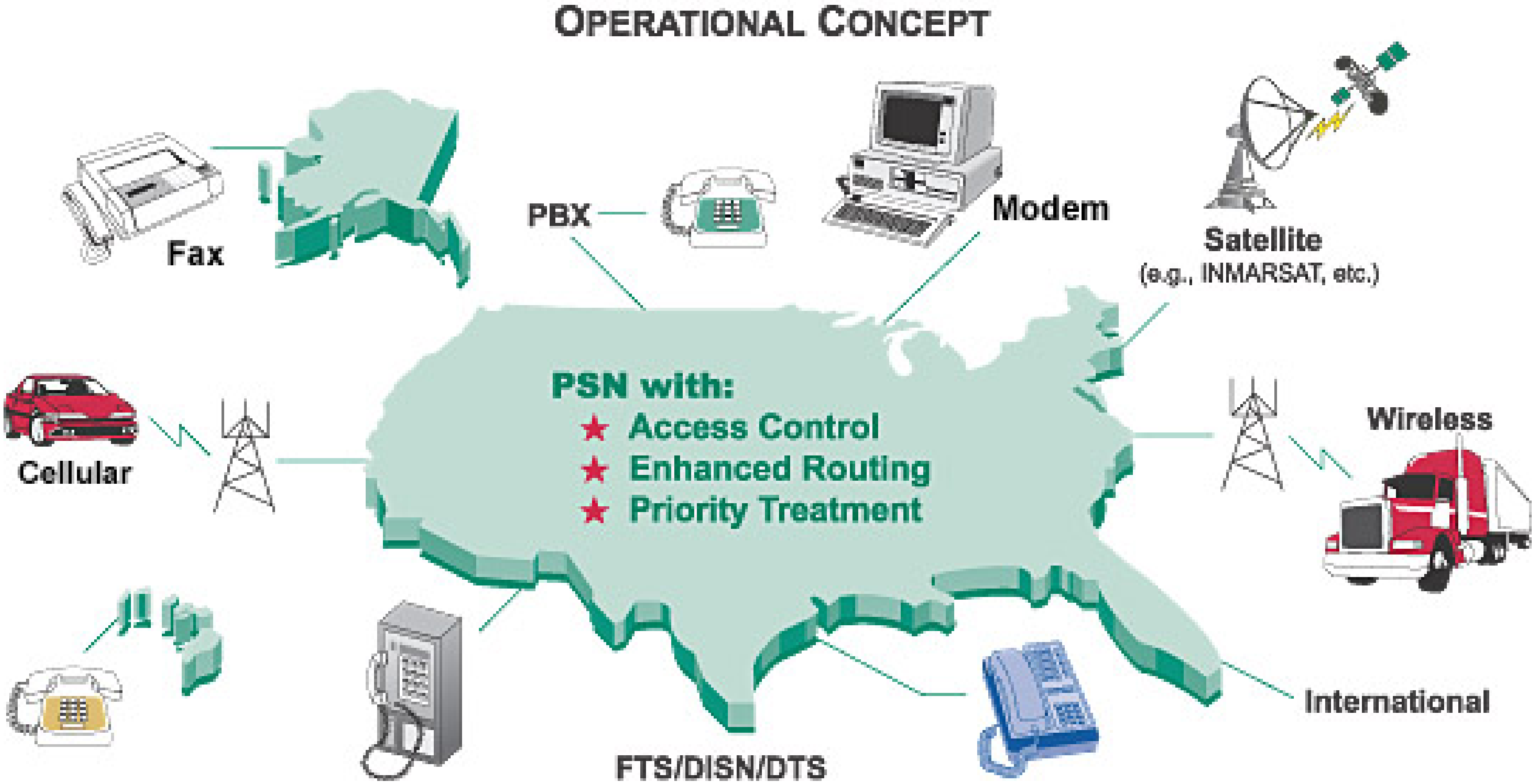
How GETS Works

- Dialing Plan
  - Normal access mode is through your pre-subscribed long distance carrier by dialing the universal access number, 710-NCS-GETS
- Access Through Personal Identification Numbers (PINs)
  - Numerous safeguards have been implemented to protect the distribution, use, and control of these PINs

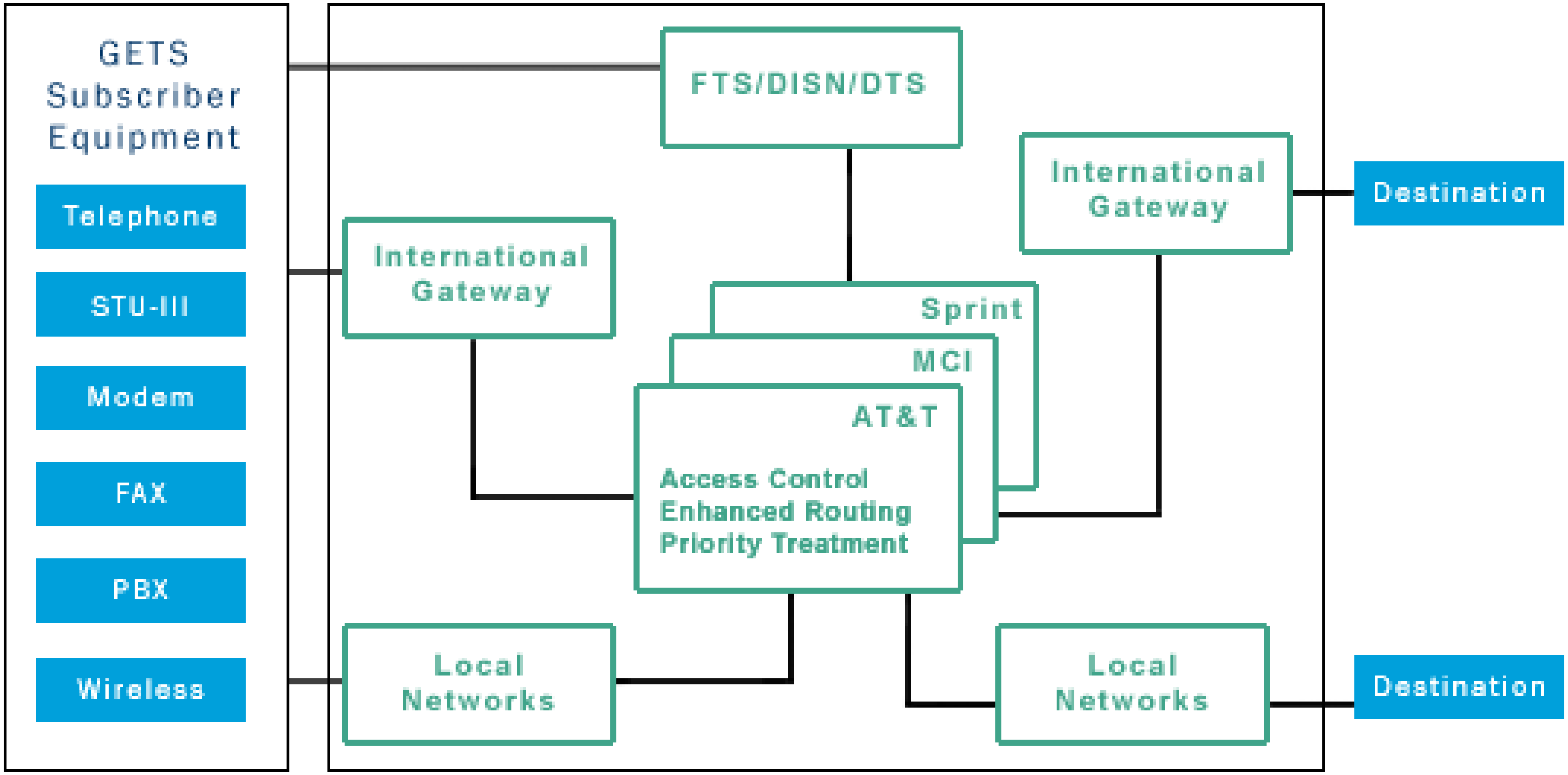
How GETS Works

- Priority Treatment
  - GETS traffic receives priority treatment over normal traffic through:
    - Controls such as trunk queuing, trunk sub-grouping, or trunk reservation
    - Exemption from protective network management controls, which are used to reduce network congestion
    - High probability of completion (HPC) capability to provide
      - NS/EP identification
      - Priority signaling
- These features enhance the capability of NS/EP calls to be completed in congested networks.
- GETS will not preempt public traffic, nor are there levels of precedence in GETS.

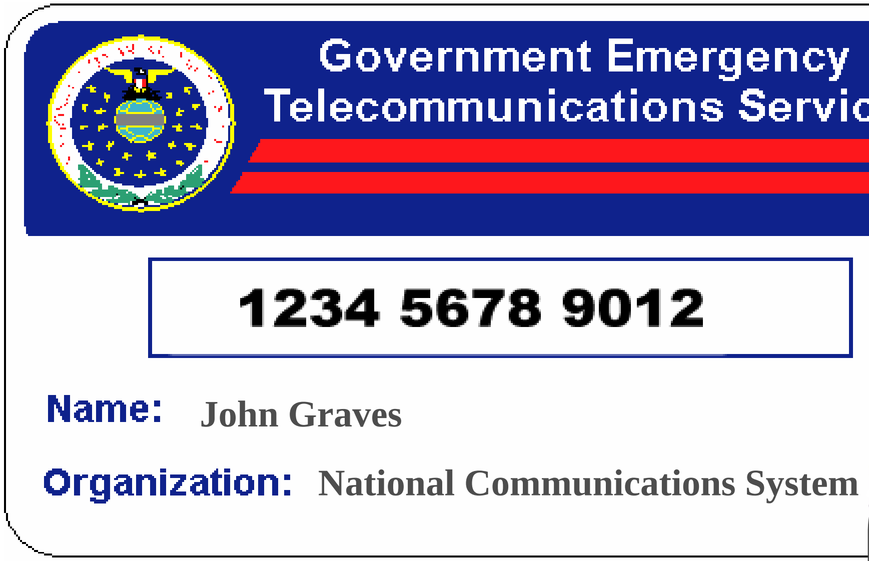
GETS Operational Concept



GETS Architecture



GETS Calling Card



Government Emergency Telecommunications Service

1234 5678 9012

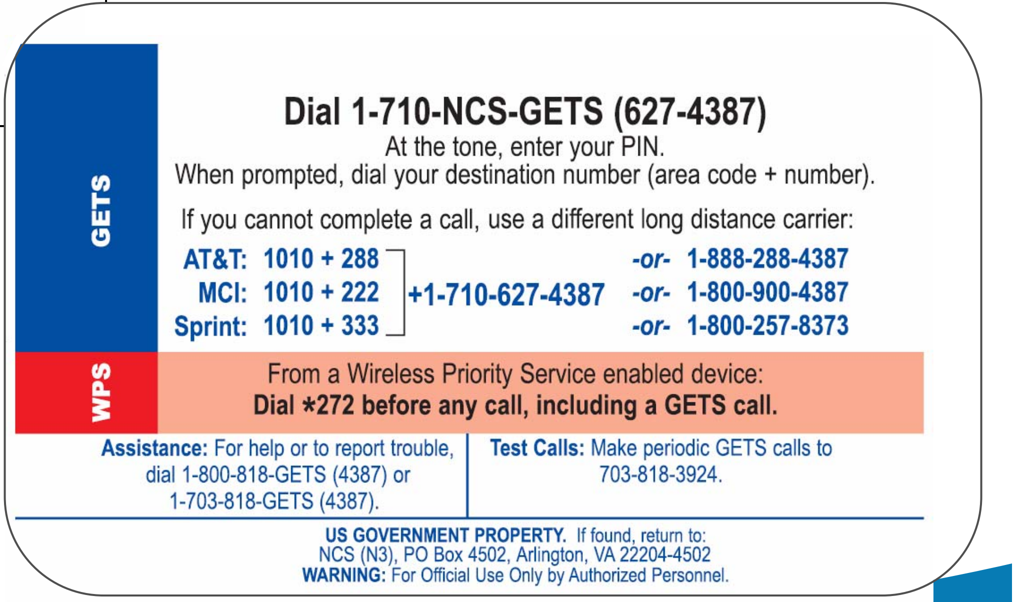
Name: John Graves

Organization: National Communications System

Calling cards are in widespread use and easily understood by the NS/EP user, simplifying GETS usage

GETS priority is invoked "call-by-call"

GETS is a "ubiquitous" service in the Public Switched Telephone Network…if you can get a DIAL TONE, you can make a GETS call



GETS

Dial 1-710-NCS-GETS (627-4387)

At the tone, enter your PIN.

When prompted, dial your destination number (area code + number).

If you cannot complete a call, use a different long distance carrier:

AT&T:	1010 + 288	+1-710-627-4387	-or- 1-888-288-4387
MCI:	1010 + 222		-or- 1-800-900-4387
Sprint:	1010 + 333		-or- 1-800-257-8373

WPS

From a Wireless Priority Service enabled device:

Dial *272 before any call, including a GETS call.

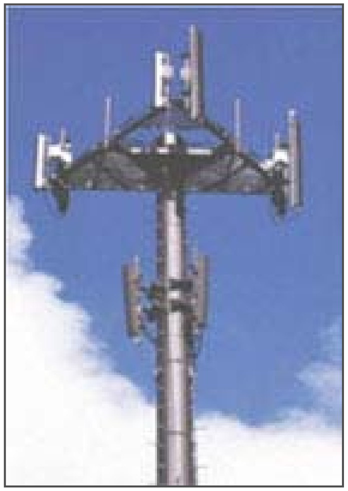
Assistance: For help or to report trouble, dial 1-800-818-GETS (4387) or 1-703-818-GETS (4387).

Test Calls: Make periodic GETS calls to 703-818-3924.

US GOVERNMENT PROPERTY. If found, return to:
NCS (N3), PO Box 4502, Arlington, VA 22204-4502
WARNING: For Official Use Only by Authorized Personnel.

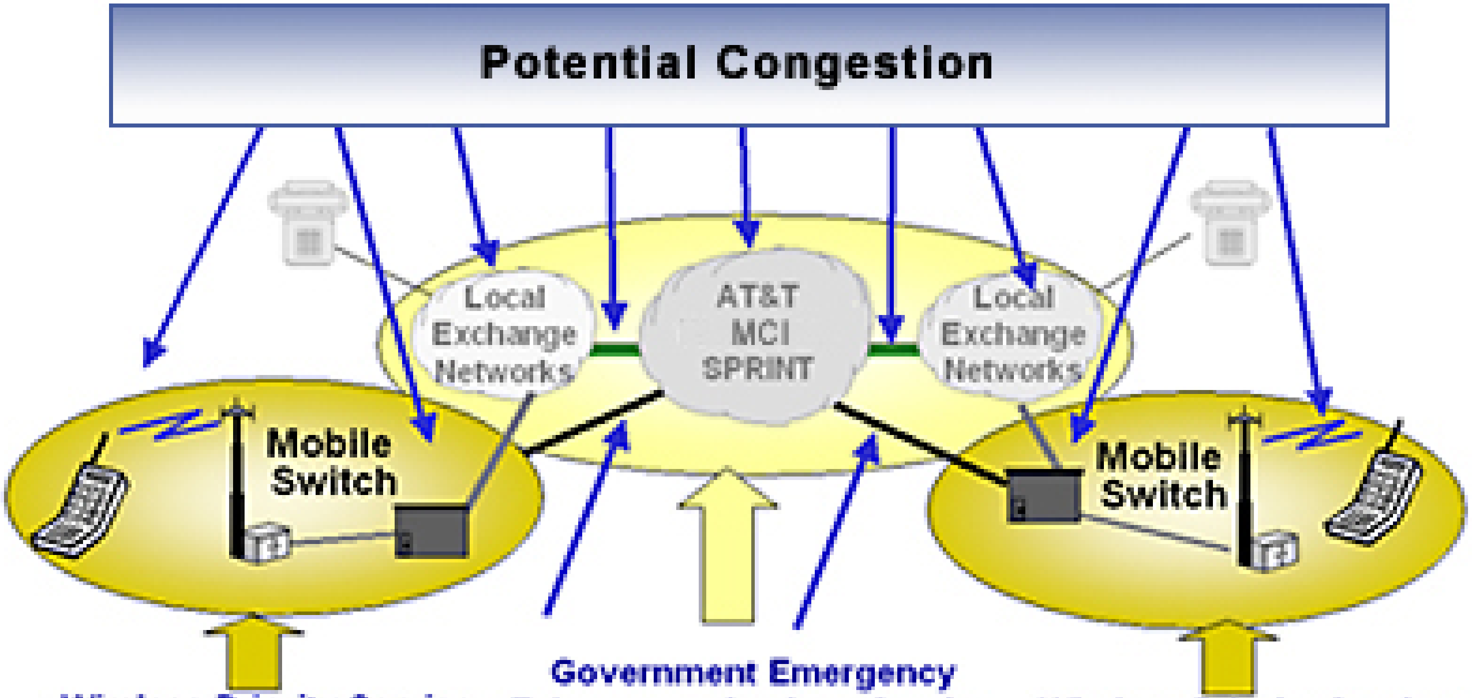
Wireless Priority Service (WPS)

WPS increases your ability to make calls when cellular networks are congested



[redacted]

Fundamental Issue is Congestion

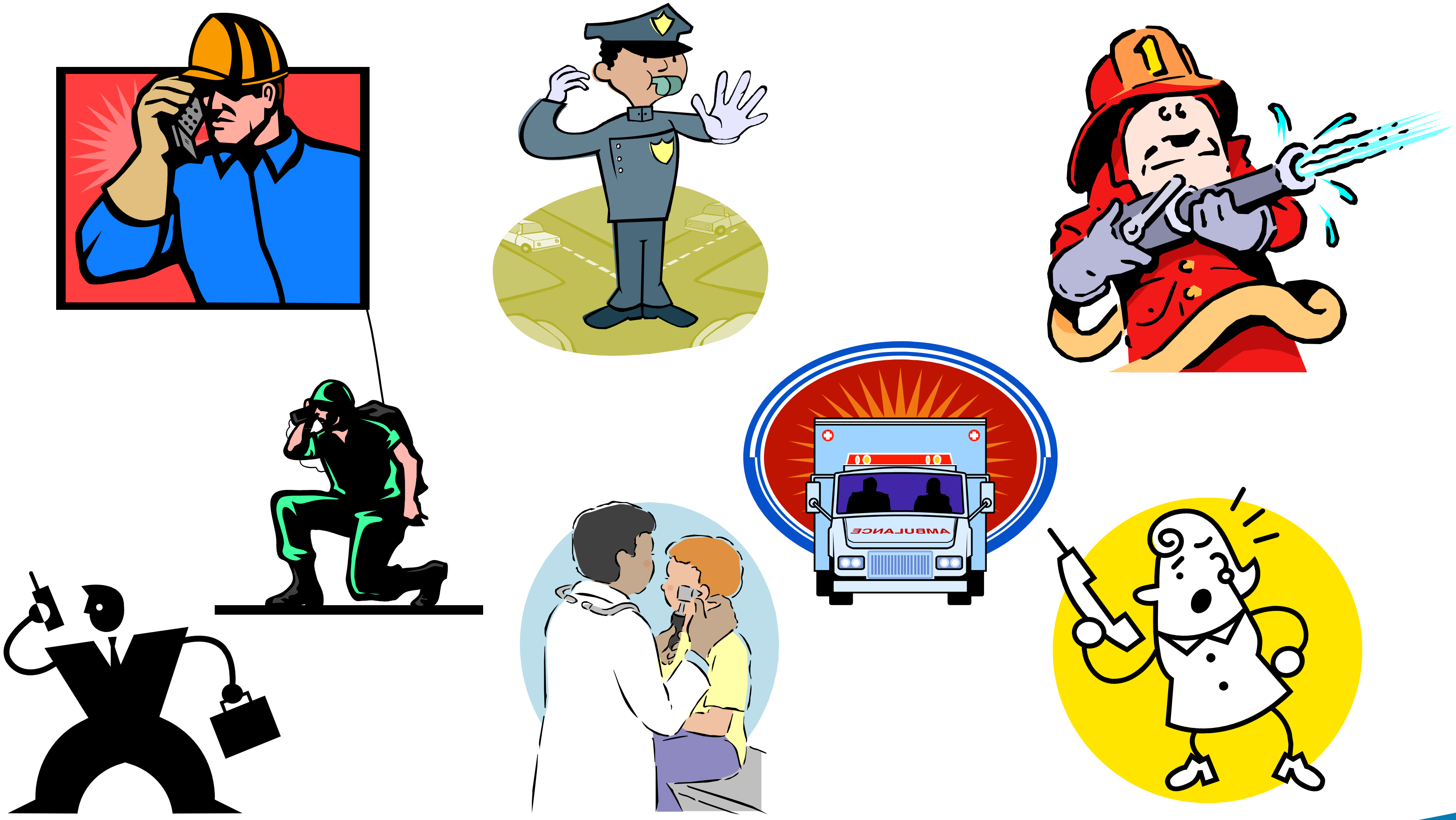


Wireless Priority Service
addresses wireless congestion

Government Emergency Telecommunications Service
addresses wireline congestion

Wireless Priority Service
addresses wireless congestion

WPS – Who get access first?



What is Wireless Priority Service (WPS)?

- Wireless Priority Service (WPS) is a priority calling capability that greatly increases the probability of call completion when a National Security/Emergency Preparedness (NS/EP) user is unable to complete emergency calls while using their cellular phone.

- WPS is an add-on feature subscribed on a per-cell phone basis that works with existing cell phones in WPS enabled cellular networks; no special phones are required.

- WPS provides priority for emergency calls through a combination of special cellular network features and the same “High Probability of Completion” features used by GETS:
  - WPS Originating Radio Channel Priority
  - WPS High Probability of Completion Features
  - WPS Terminating Radio Channel Priority

WPS Originating Radio Channel Priority

- WPS addresses congestion in the local radio access channel (or cell), which is often the reason that cellular calls cannot be made during heavy calling periods or when damage to network infrastructure occurs.

- WPS automatically provides priority access to local radio channels, placing WPS calls in queue for the next available channel if a channel is not immediately available.

- Originating Radio Channel Priority requires WPS feature activation on the calling cellular phone.

- WPS calls do not preempt calls in progress nor will WPS users monopolize all available cellular resources.

WPS High Probability of Completion Feature

- When a radio access channel becomes available and the call proceeds, WPS calls are assigned a unique “NS/EP” call marking by the cellular network switching equipment.

- This marking triggers industry standard High Probability of Completion (HPC) features residing in most U.S. telecommunications networks as calls are routed from the originating cell to the called cellular or landline phone.

- These HPC features significantly increase the probability of call completion should the call encounter network congestion or blockage beyond the originating cell.

- Thus, WPS calls receive similar “across the network” priority as GETS calls without having to dial the GETS access number and PIN.

WPS Terminating Radio Channel Priority

- Incoming WPS (and GETS) calls to cell phones served by WPS enabled cellular networks automatically receive priority access to local radio channels, placing incoming GETS and WPS calls in queue for the next available channel if a channel is not immediately available.

- Terminating Radio Channel Priority does NOT require the called cellular phone to be subscribed to WPS.

- Incoming GETS and WPS calls do not preempt cellular calls in progress nor will they monopolize all available cellular resources.

Making WPS Calls

- When an NS/EP user encounters difficulty completing an emergency call using their cell phone, they should re-attempt the call using WPS.

- To make a WPS call dial *272 + Destination Number and push the SEND key (Example: *272 703 818 4387 + SEND).

- Prior WPS subscription is required.

WPS Eligibility

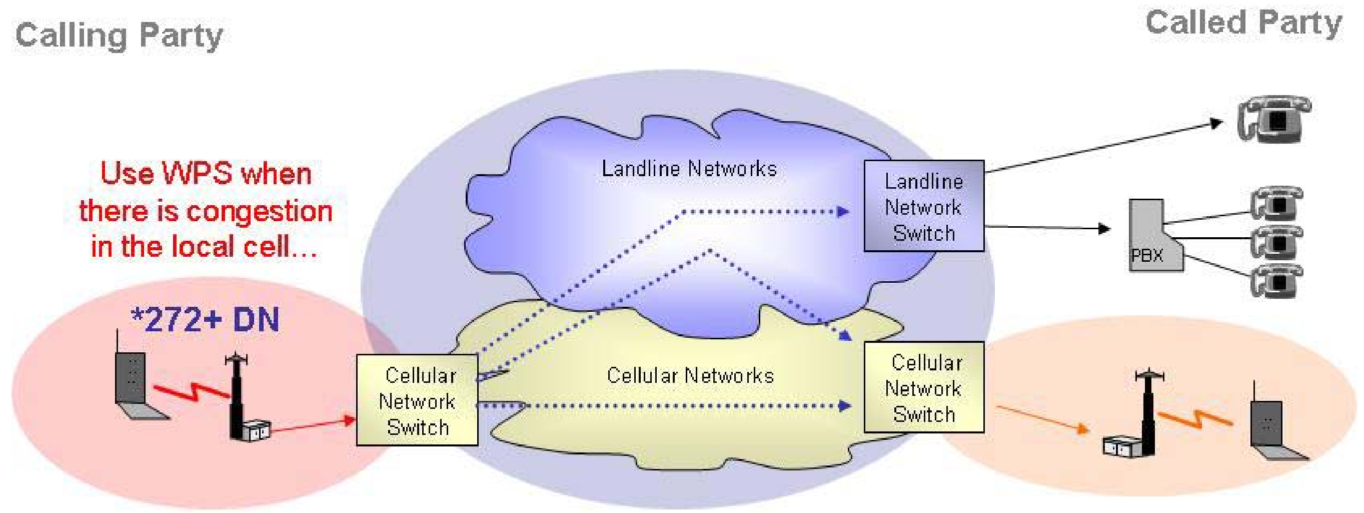
- Key Federal, state, local, and tribal government, and critical infrastructure personnel are eligible for Wireless Priority Service.

- As part of the on-line WPS Service Request, participating organizations qualify eligibility of each WPS user based upon five categories of WPS NS/EP criteria established by the NCS:
  - Executive Leadership and Policy Makers
  - Disaster Response/Military Command and Control
  - Public Health, Safety and Law Enforcement Command
  - Public Services/Utilities and Public Welfare
  - Disaster Recovery

- To ensure communications for senior leadership, these five categories are also used to assign levels of priority when WPS calls are placed in an originating radio channel queue.

- All WPS and GETS calls have the same priority across the network and in the terminating radio channel queue.

Wireless Priority Service



Use WPS when there is congestion in the local cell…

Originating Radio Channel Priority

- Requires WPS subscription and dialing *272 plus Destination Number
- Provides priority access (queuing) to local radio channels
- Dialing *272 also activates HPC in Full Operating Capability (FOC) cellular networks

High Probability of Completion Features

- Unique GETS/WPS Call Marking
- Signaling Priority
- Trunk Queuing
- Exemption from Network Management Controls*
- Alternate Carrier Routing*

* Landline Network Features

Terminating Radio Channel Priority

- WPS (and GETS) calls to cell phones served by cellular networks with WPS Full Operating Capability (FOC) automatically receive priority access (queuing) to local radio channels
- Does NOT require WPS subscription

Telecommunications Service Priority (TSP)

- Provides guaranteed priority restoration of wireline telecommunications services when service providers' resources are overextended
- Provides priority provisioning for wireline telecommunications services when the normal provider processes will not meet the need

[redacted]

TSP Categories

Restoration

A restoration priority is applied to new or existing telecommunications services to ensure restoration before a non-TSP program user.

Must be requested and assigned ***before*** a service outage occurs

Provisioning

A provisioning priority is obtained to facilitate the priority installation of *new* telecommunications services in a shorter than normal interval.

Cannot be used to compensate for inadequate planning

What is Telecommunications Service Priority (TSP) Program?

- The Telecommunications Service Priority (TSP) Program provides national security and emergency preparedness (NS/EP) users priority authorization of telecommunications services that are vital to coordinating and responding to crises.

- Telecommunications services are defined as the transmission, emission, or reception of intelligence of any nature, by wire, cable, satellite, fiber optics, laser, radio visual or other electronic, electric, electromagnetic, or acoustically coupled means, or any combination thereof.

- As a result of hurricanes, floods, earthquakes, and other natural or man-made disasters, telecommunications service vendors may become overwhelmed with requests for new telecommunications services and requirements to restore existing telecommunications services.

- The TSP Program provides service vendors with a FCC mandate for prioritizing service requests by identifying those services critical to NS/EP.

- A telecommunications service with a TSP assignment is assured of receiving full attention by the service vendor before a non-TSP service.

Scope of TSP Program

- The TSP Program rules, as specified in the TSP Report and Order (FCC 88-341), authorize priority treatment to the following telecommunications services

- **Domestic NS/EP Services:**
  - Common carrier services that are interstate and foreign telecommunications services
  - Common carrier services that are intrastate telecommunications services inseparable from interstate or foreign telecommunications services, including intrastate telecommunications services to which TSP priority levels are assigned
  - Services that are provided by government and non-common carriers and are interconnected to common carrier services assigned TSP priority levels.

Commercial Mobile Alert Service (CMAS)

- Supplement emergency alert service utilizing commercial mobile services

- Extension to Emergency Alert Services (EAS)

What is EAS Today?

Emergency Alert System -- EAS

- Current EAS System
  - Evolved from Earlier Emergency Broadcast System (EBS) & Original "CONELRAD System" developed during WWII

- EAS relies on radio & TV broadcast stations to relay emergency alert messages from federal, state, & local authorities

- Messages may pertain to any immediate threat to public safety
  - Includes enemy attack, storm warnings, earthquake alerts, tsunami warnings, wildfires, AMBER alerts, and terrorism

- Messages are relayed from station to station using automatic switching systems and digital signaling

NOAA Weather Alert & National Weather Radio (NWR)

- NWR → All-Hazards Public Warning System
  - Broadcasting forecasts, warnings and emergency information 24 hours a day 7 days a week directly to the public

- NWR Uses Seven Frequencies in 162 MHz Band

- Specific Area Message Encoding (SAME)
  - Remain silent until an alert is received for a specific geographic area

What Are All Hazards?

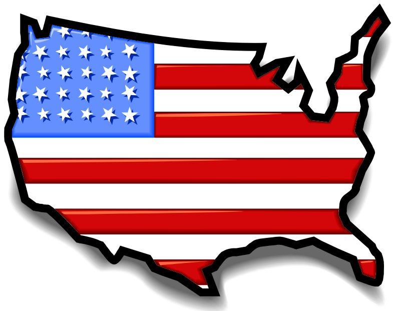
All Hazards Emergency Messages Include

- Natural Hazards
  - Tornadoes
  - Hurricanes
  - Volcanoes
  - Floods
  - Earthquakes
- Technological Accidents
  - Chemical Releases
  - Oil Spills
  - Nuclear Power Plant Emergencies
- Terrorism
- AMBER Alerts
- Other Alerts

NWR & EAS

- NWR & EAS Use Same Digital Protocols
- NWR is Primary Means for NWS Alerts to Activate the EAS
- Criteria to Disseminate Non-Weather Related Civil Emergency Messages
  - Public Safety is Involved
  - Message Originates From Official Government Source
  - Information is Time Critical

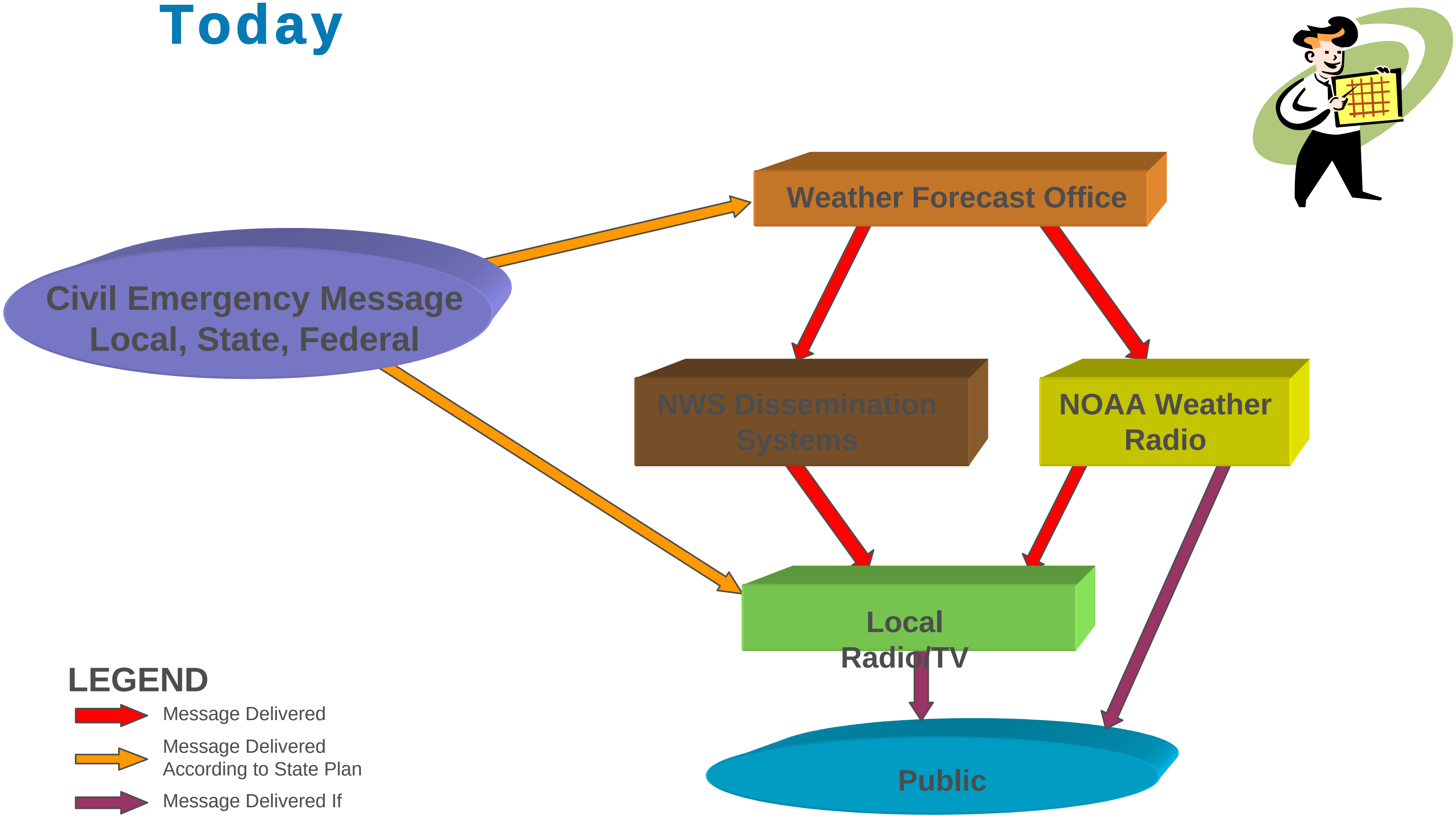
National Weather Radio Coverage



- Over 900 NOAA Weather Radio stations across the U.S.
  - Covers 97% of Nation

- Twenty-two Stations Broadcast in Washington State

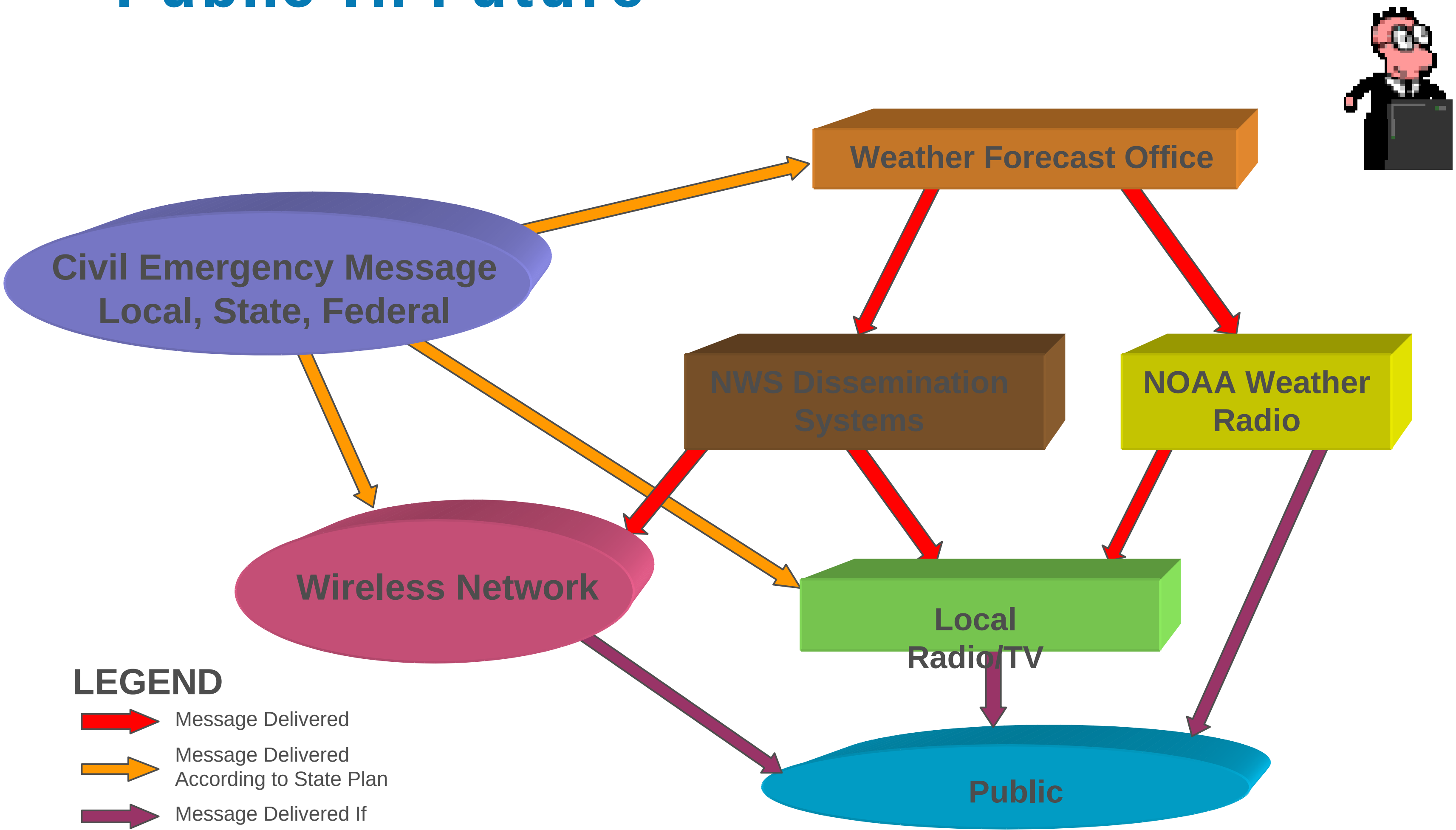
How Emergency Messages Reach Public Today



LEGEND

- → Message Delivered
- → Message Delivered According to State Plan
- → Message Delivered If Appropriate Receiver Exists

How Emergency Messages Could Reach Public In Future



Weather Forecast Office

Civil Emergency Message
Local, State, Federal

NWS Dissemination
Systems

NOAA Weather
Radio

Wireless Network

Local
Radio/TV

Public

LEGEND

🟥 Message Delivered

🟧 Message Delivered
According to State Plan

🟪 Message Delivered If
Appropriate Receiver
Exists

Why Does EAS Need To Change?

- Warnings Do Not Reach Many People At Risk
- Existing Systems Fragmented & Do Not Take Advantage of New Technologies
- Need More Immediate Communication to Citizens
  - Tsunamis, Volcanic Activity, Earthquakes
  - Weather Conditions
  - Chemical Spills & Toxic Gas Clouds
  - Terrorism Acts
- Maximize Communication Channels & Methods
  - Proliferation of Mobile Devices
  - Widespread Usage of Internet Access
  - Digital Broadcast Capabilities
- Supplement Existing Alerting by Radio & TV Broadcasts

What is Commercial Mobile Alert Service (CMAS)?

- Commercial Mobile Alert Service (CMAS) being developed in accordance with WARN (Warning, Alert and Response Network) Act

- US Congress Passed WARN Act as Part of SAFE Port Act
  - Act passed on September 30th

- Act Signed by U.S. President George W. Bush on Friday October 13th, 2006

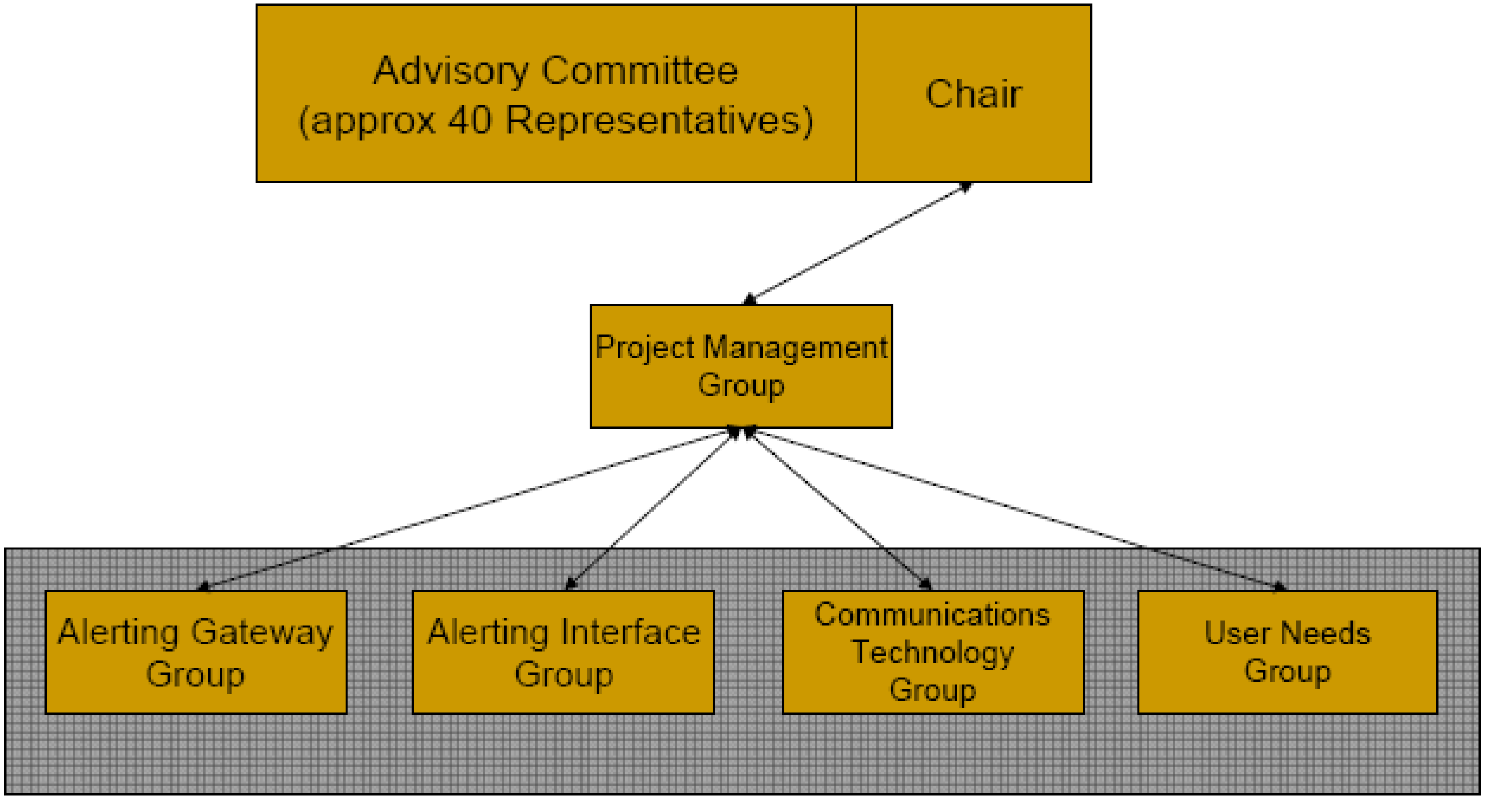
Scope of WARN Act

- Scope of WARN Act limited to licensee providing commercial mobile service as defined in section 332(d)(1) of the Communications Act of 1934 → 47 U.S.C. 332(d)(1)
  - Includes mobile service that is provided for profit and makes interconnected service available (i.e., service that is interconnected with the public switched network)
  - Excludes
    - Radio broadcasts
    - TV broadcasts
    - Satellite broadcasts
    - Public Safety communications systems (e.g., 800 MHz systems)

- Scope clarification by FCC Commercial Mobile Service Alert Advisory Committee Project Management Group on February 15, 2007
  - WARN Act and associated activities of Commercial Mobile Service Alert Advisory Committee limited to Wireless Alerts and is not Emergency Alert Services (EAS)
  - WARN Act services are for the delivery of alerts to wireless subscribers and not for delivery of detailed instructions or information
  - Wireless Alerts are only for alerting of immediate, serious, and likely threats to life, health or property

  - http://www.fcc.gov/pshs/CMSAAC/StructureandGoals.pdf

Advisory Committee Organization



Advisory Committee
(approx 40 Representatives)

Chair

Project Management Group

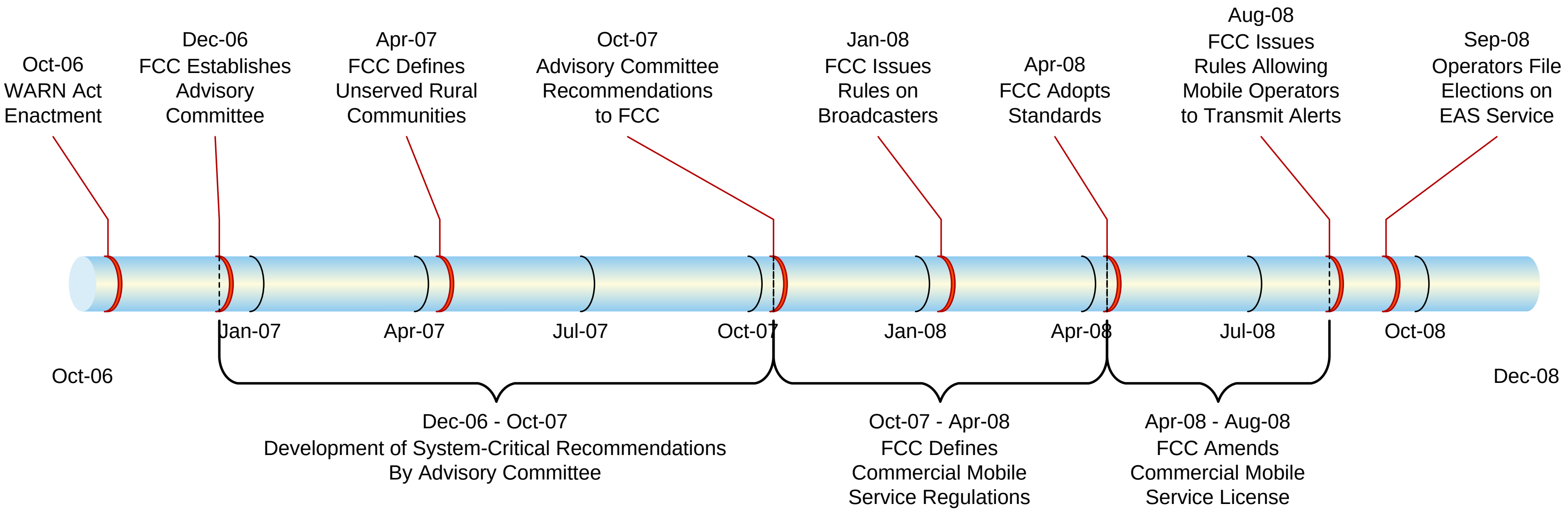
Alerting Gateway Group

Alerting Interface Group

Communications Technology Group

User Needs Group

WARN Act Timeline



Oct-06
WARN Act
Enactment

Dec-06
FCC Establishes
Advisory
Committee

Apr-07
FCC Defines
Unserved Rural
Communities

Oct-07
Advisory Committee
Recommendations
to FCC

Jan-08
FCC Issues
Rules on
Broadcasters

Apr-08
FCC Adopts
Standards

Aug-08
FCC Issues
Rules Allowing
Mobile Operators
to Transmit Alerts

Sep-08
Operators File
Elections on
EAS Service

Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Dec-08

Dec-06 - Oct-07
Development of System-Critical Recommendations
By Advisory Committee

Oct-07 - Apr-08
FCC Defines
Commercial Mobile
Service Regulations

Apr-08 - Aug-08
FCC Amends
Commercial Mobile
Service License

Enactment date was 13 October 2006

WARN Act Requirements

- Voluntary for Mobile Operators to Elect to Transmit Wireless Alerts
  - Elections can be in whole or in part {Sec. 602.(b)(1)(B)}
  - If elect not to transmit in whole or part
    - If elect not to transmit to specific devices must provide clear and conspicuous notice at point at sale that alerts that provided for that device {Sec. 602.(b)(1)(B)}
    - If elect not to transmit to any subscriber must notify all existing subscribers {Sec. 602.(b)(1)(C)}
  - If elect to transmit
    - Must comply with standards, protocols, procedures, and regulations adopted by FCC {Sec. 602.(b)(2)(B)(ii)}
    - Utilize Advisory Committee defined process, if not all devices or equipment are capable of receiving alerts {Sec. 603.(c)(6)(a)}
    - Utilize Advisory Committee defined process, if can not offer alerts in the entire service area {Sec. 603.(c)(6)(b)}

WARN Act Requirements

- May offer subscriber opt-out of wireless alerts {Sec. 602.(b)(2)(E)} & {Sec. 603.(c)(5)}
  - Classes of alerts
  - Can not opt-out of Presidential level alert
- Protocols, capabilities, and procedures to receive, verify, and transmit alerts will be defined by the Advisory Committee {Sec. 603.(c)(1)}
- Priority transmission of alerts {Sec. 603.(c)(2)}

WARN Act Requirements

- Transmission in languages in addition to English to the extent practical and feasible {Sec. 603.(c)(4)}
- No Fee for Service {Sec. 602.(b)(2)(C)}
- No specific requirements in WARN Act for support of individuals with disabilities; however, specified membership list of the Advisory Committee includes national organizations representing individuals with special needs {Sec. 603.(b)(3)(F)}

Conclusions

&

Recommendations

Before the Disaster

- Designate a contact point for messages if family, friends, volunteers, employees will need to let you know their status
- Have an out-of-area contact name and number. This may be the only way to reunite your team with their families or let relatives know someone is injured
- Inform your relatives not to try to reach you
  - You will get word to them via their designated out-of-area contact.
- Pre-designate where amateurs are to report if normal communications are overloaded
  - This prevents having to use calling trees which add to the congestion on the telephone network

Immediately After the Disaster

- Check all telephones to verify the receivers are properly on their hooks
- Use your phone only for emergency calls
- If you have to make an emergency call, pick up the receiver and listen for dial tone.
  - It may a few minutes
  - Do not flash the switchhook - that just sends you to the back of the waiting line
- Be ready to dial your number when you hear the dial tone.
  - The telephone equipment will only wait half as long as usual before sending a tone back if it doesn’t receive your digits
- If you receive a call from someone out of the area, have them inform your out-of-area contact point that you are O.K.
  - This will eliminate your need to make the call

Until Full Communications are Restored

- Continue to limit your use of the phone. It may take several days before the increased calling subsides
- Do not use the phone unless you have an emergency.
  - Earthquake scenario →Every aftershock creates a resurgence of use on the phone network, causing additional congestion.
- Keep your out-of-area contact informed at reasonable intervals
  - Remember, the best time to place a call is between 10 PM and 6 AM when other calling has subsided

The Landline Phones in Disasters

- In a power outage, any phone requiring power will not work
  - Cordless phones as an example
  - Have a phone available that does not require power!
    - If the phone system is operating and you can’t make a call, you are in no better shape!
    - The transformers for many (but not all) cordless phones provide a D.C. output. You can substitute a burglar alarm or other D.C. (Rechargeable battery) supply to power your phone, and it may continue to work properly during a power failure.

- Don’t make a call unless absolutely necessary!
  - “Mother’s Day effect”

What if my phone does not work?

- If you do not have a dial tone, try unplugging all the telephones.
  - Plug in one at a time and listen for dial tone.
  - This will help you determine if the telephone instrument is broken or the phone service is completely out.

- If the event affected only your home (no others in your neighborhood), contact the telephone company using a cellular telephone or a neighbor's phone to report the problem and to request repair services.

- Keep a fair amount of change in your go kit!
  - Payphones

ICE

- ICE → In Case of Emergency

- Contact Names for Inclusion on Cell Phone Address Phones
  - Provides first responders and emergency personal with the contact information of those to contact in case of an emergency

- Example Entries
  - ICE Wife
  - ICE Father
  - ICE Son

Conclusions - GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, Dec 2005

- For the public, the key lesson is ‘text not talk’ during emergencies.
  - Text messages are more likely to get through
  - Text message will also help ease congestion on the network

- Public information campaigns should emphasize the role mobile phones can play in helping recover from a disaster
  - For example, both the FCC and the local operators have posted consumer advisories, telling customers:
    - To ensure their handset batteries are charged ahead of an emergency
    - To have a back-up battery
    - To keep their phones dry
    - To expect the network to be busy in the aftermath of an event such as a hurricane.

Conclusions - GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, Dec 2005

- Mobile phones tend to play a supplementary role in early warning systems

- Public education and a range of news media, such as broadcast television, radio and the Internet are generally the best way to prepare people for an impending disaster.

- Mobile phones are not currently an efficient way to broadcast information to large numbers of people
  - But they can be a useful mechanism for individuals to relay that information on to friends and family who may have missed the initial broadcast.

Conclusions - GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, Dec 2005

- During the hours of impact of a natural disaster or terrorist attack, mobile networks inevitably experience congestion.
  - Network data suggest this congestion is often similar to that seen at other peaks such as New Year and Mother’s Day

- Operators need to prioritize calls at such times, and manage other demands on the network.
  - Operators and governments should work together to ensure mobile networks can recover as quickly as possible when damaged because many emergency services rely on mobiles to communicate with each other.

Conclusions - GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, Dec 2005

- In the immediate aftermath of a disaster the contribution of mobile is substantial thanks to the speed with which cellular networks can generally recover from damage, usually within hours or at most a few days.
  - It is typically much easier to repair a wireless base station than hundreds of fixed-line connections.
  - This was strikingly demonstrated in the speed of restoration of mobile services to customers in the Gulf region of the United States after Hurricane Katrina.
  - New mobile networks can be set up relatively quickly in places where there was either no network to begin with or the original network was damaged.

Conclusions - GSM Association Report “The Role of Mobiles in Disasters and Emergencies”, Dec 2005

- During these chaotic situations, mobile phones can help in the process of recovery.
    - Give affected people and aid agencies the means to find and receive information specific to their needs.

- Aid agencies are finding text messages and mobile calls are an increasingly important means of fund-raising, giving them rapid access to funds donated by members of the public.

Wireless Lessons Learned

- Katrina has demonstrated that there is no thickness of steel or level of network redundancy that can guarantee any communications network will survive a worst-case natural or man-made disaster

- Two most important lessons learned from Katrina
  - The effectiveness of Wireless Priority Services (WPS)
  - Need to develop a wireless solution for worst-case scenarios where the local network infrastructure has been destroyed

Satellite Phone and Information Services

- If you have a satellite phone, do you have the numbers for everyone you need to contact?
  - Landline, cell, satellite numbers
- Do you know how to use the satellite phone?
- Are you prepared to cover the cost?
- Did you know XM Radio & Sirius offer 24/7 “Emergency Alert” channels?
  - *May* not need a subscription
- DirecTV or Dish Network to get news & information?

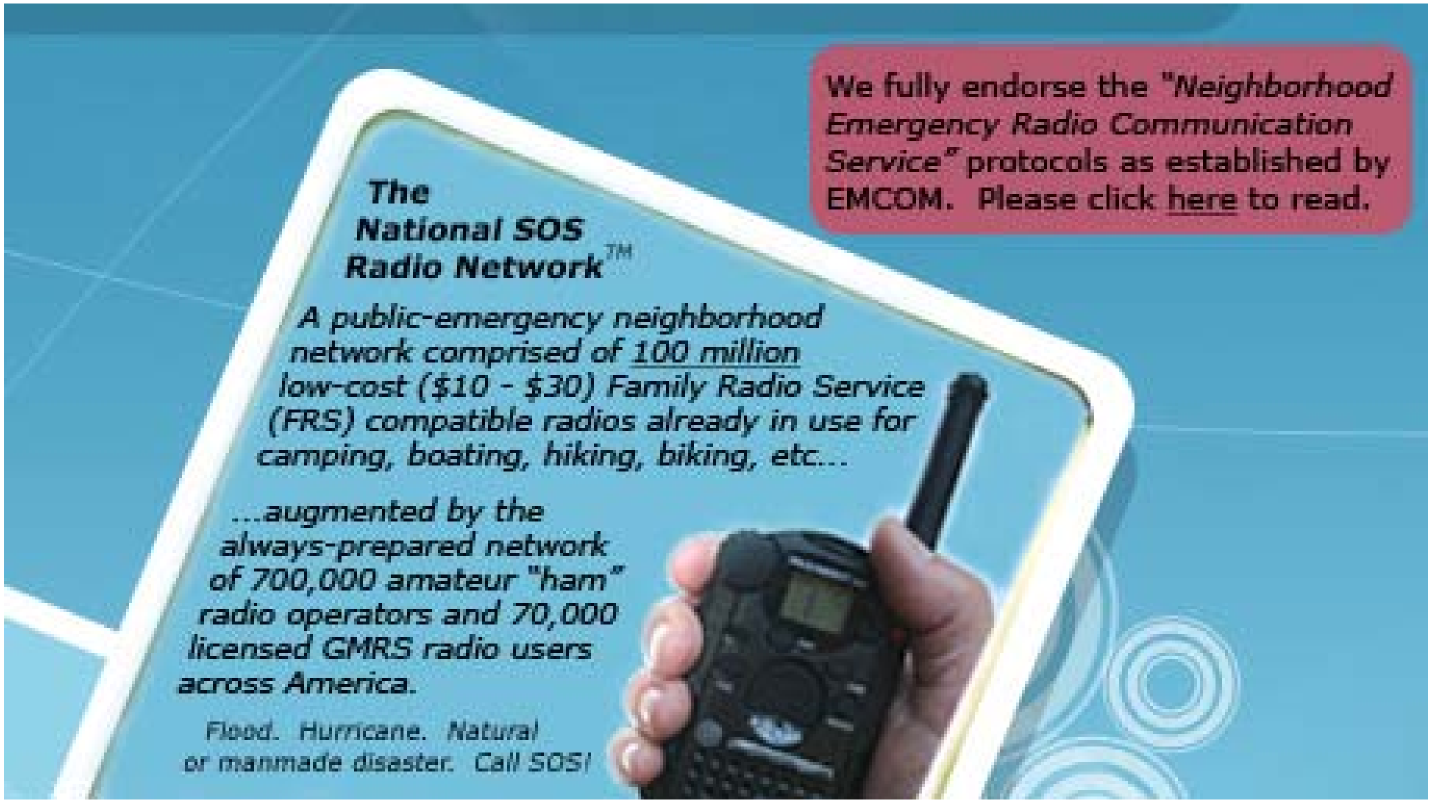
Where do we go from here?

- We must ensure that the public has the tools necessary to be alerted when an emergency is coming and to contact first responders
    - Must include the Internet
- Enable first responders to communicate seamlessly during a disaster
    - New technologies such as "smart radios" and mobile antennas can be used to re-establish communication as quickly as possible
    - Equipment that can communicate on multiple frequencies and in multiple formats so police, firefighters and EMS personnel at the local, state and federal levels can all talk to one other
- Communications providers develop and adhere to best practices to ensure reliability and quick restoration of services in the event of a disaster.
    - Include maintaining service during extended commercial power outages using back-up generators and equipment

> “I would also like to see a greater use of IP technologies that are capable of changing and rerouting telecommunications traffic. In the event of a systems failure within the traditional network, such IP technologies would enable service to be restored more quickly and would provide the flexibility to initiate service at new locations chosen by consumers.”

Remarks of Chairman Kevin J. Martin
Second Meeting of the FCC’s Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks
Jackson, Mississippi
March 6, 2006

Other Initiatives…



We fully endorse the *"Neighborhood Emergency Radio Communication Service"* protocols as established by EMCOM. Please click here to read.

The National SOS Radio Network™

A public-emergency neighborhood network comprised of 100 million low-cost ($10 - $30) Family Radio Service (FRS) compatible radios already in use for camping, boating, hiking, biking, etc…

…augmented by the always-prepared network of 700,000 amateur "ham" radio operators and 70,000 licensed GMRS radio users across America.

Flood. Hurricane. Natural or manmade disaster. Call SOS!

http://www.nationalsos.com/

Other initiatives…

- If normal modes of communication go down or become unreliable -- because of a terrorist attack, power outage, cell phone network congestion, storm or other problem-- the DC Emergency Radio Network is a pre-planned way of communicating and relaying vital information
- DCERN uses Family Radio Service (FRS) and General Mobile Radio Service (GMRS) radios on channel 1, no privacy channel (subchannel 0)

dcern

THE DC EMERGENCY
RADIO NETWORK

WHEN ALL ELSE FAILS...
A R R L
AMATEUR RADIO
146.610

Thank You for Listening

Questions?